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THE COMMERCIAL FATTENING OF POULTRY.

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INTRODUCTION.

The fattening experiments described in Bureau of Animal Industry Bulletin 140, entitled "Fattening Poultry," are continued in this bulletin, which represents the results of two more years' work covering the feeding seasons of 1911 and 1912. The methods and equipment at the four feeding stations are the same as described in the former bulletin, except for slight changes in equipment which are noted in this publication. The present experiments cover wider conditions and include larger numbers of birds than the previous work, and so permit of much better comparisons being made. The rations were varied at some of the stations, thus giving good comparisons of the value of different feeds under the same conditions; while the differences in equipment, methods, and rations at the various stations allow comparisons of results secured in several different ways.

The extent of the experiments, the numbers of birds included in each test, and the opportunity for comparison with the previous season's work eliminate largely the possibility of error that is liable to occur in dealing with small numbers, which give very variable results in fattening tests. The danger of deriving wrong conclusions by not properly allowing for the influencing conditions is also reduced to a minimum.

THE FEEDING EXPERIMENTS.

A full description of the four stations where the feeding was carried on will be found in Bulletin 140, before mentioned, as well as a number of other details concerning the equipment and methods of fattening in the large poultry packing houses of the Middle West which are not included in the present paper, as it is considered unnecessary to repeat them here.

The work of 1911 and 1912, herein described, is composed of four experiments, designated A, B, C, and D. These are summarized and

discussed in the following pages, and the complete details of each are recorded in Tables I to IV of the appendix at the end of the paper. The main object of the summary tables is to show the results according to length of feeding period, which varied from 6 to 21 days in Experiments A and D, from 9 to 18 days in Experiment B, and from 7 to 16 days in Experiment C. All the various kinds of birds are necessarily mixed together in showing these results, but the averages for two of the main classes—broilers and roasters—are shown separately, irrespective of length of feeding period, at the bottom of each table.

The actual cost of producing the gains in each case is given under each experiment, and as the price of grain and milk varied somewhat in the different localities, the relative amount of feed required to produce a pound of gain is used in comparing the efficiency of the rations and the methods at the different stations rather than the cost of the gains, except where different feeds are used.

PRICES OF THE FEED USED.

Before describing the feeding operations, the following list of average prices of the grain and buttermilk used is given:

TABLE 1.—*Average prices of grain and buttermilk used in the feeding experiments.*

Year.	Feed.	Experiment A.	Experiment B.	Experiment C.	Experiment D.
1911	Corn meal, per 100 pounds.....	\$1.38	\$1.32	\$1.45	\$1.35
1912	do.....	1.48	1.39	1.69	1.74
1911	Low-grade wheat flour, per 100 pounds.....	1.42	1.30	1.35	1.30
1912	do.....	1.50	1.38	1.45	1.52
1911	Oat flour, per 100 pounds.....		2.25		
1912	do.....		1.50		
1911	Shorts, per 100 pounds.....	1.25	1.30	1.28	1.30
1912	do.....	1.20	1.18	1.27	1.20
1911	Linseed meal, per 100 pounds.....			2.50	2.50
1911	Tallow, per 100 pounds.....		7.00		
1912	do.....		8.00		
1911	Buttermilk, per gallon.....		.02	.01	
1912	do.....		.02	.01	
1911	Condensed buttermilk, per gallon.....	.08		.08	.08
1912	do.....	.06			.08
1912	Graham flour, per 100 pounds.....				1.50
1912	Bone, per 100 pounds.....				3.25
1912	Meat, per 100 pounds.....	2.00		2.50	

EXPERIMENT A, 1911.

Most of the lots in this experiment at Station 3 were fed for a short time only during the first part of the feeding season, due to the lack of suitable equipment and space for fattening. The station was overcrowded twice during the season, which lowered the gains and increased the cost in both instances. The low, tin roof made the building too hot during warm weather, and produced a thick condensation of moisture on the inside of the roof in cool weather, when the building was partially closed. The gains, except for these two crowded periods, were fairly consistent throughout the season and

compare favorably with the results at the other stations. The cheapest gains were made on short-fed lots, but many of the lots could have been fed longer with profit if conditions had been good for fattening.

FEED.

A ration made up of equal parts, by weight, of corn meal and low-grade wheat flour was fed from the commencement of the season, July 23, until August 11, when shorts were added, making equal parts of corn meal, flour, and shorts up to September 7, at which time the ration was changed to 3 parts corn meal and 2 parts flour, which was fed to the end of the season. All of these rations were mixed with condensed buttermilk, diluted with one part of water, making a thick feed. It may here be stated that whenever "parts" are mentioned in connection with a ration, it means parts by weight, and "flour" always means low-grade wheat flour.

Each of the above rations produced good results, and no apparent change in gains occurred which could be attributed to the feed when the ration was changed. The heat at this station was at times very intense, which may have made the ration containing shorts preferable to the regular ration of 3 parts of corn meal and 2 parts of flour, but the results compared with those at Station 2 (Experiment D) do not indicate that there was any advantage in adding a large proportion of shorts to this feed, provided thick condensed buttermilk was used. Later in the season good results were secured on a ration of 3 parts of corn meal and 2 parts of low-grade flour without any shorts.

In this experiment the average cost of producing flesh was greater with broilers than with roasters, which was due to the unfavorable conditions in the house, particularly to the extreme heat in the first part of the season and to over crowding later.

TABLE 2.—*Summary of Experiment A, 1911, Station 3, arranged according to length of feeding period.*

Number of head.	Days fed.	Average weight.	Per cent of gain.			Grain per pound of gain.		
			High.	Low.	Average.	High.	Low.	Average.
2,096	6	Pounds. 3.04	Per cent. 18.0	Per cent. 8.0	Per cent. 12.4	Pounds. 4.64	Pounds. 2.17	Pounds. 3.31
13,587	7	3.12	16.0	9.0	12.6	4.72	2.70	3.47
6,063	8	2.71	19.0	10.0	11.8	4.90	2.75	3.61
12,925	9	2.38	30.0	14.0	19.3	4.55	2.29	3.20
11,160	10	2.23	27.0	10.0	21.0	5.66	2.91	3.49
7,030	11	1.86	33.0	20.0	24.5	4.14	2.67	3.71
3,040	12	2.39	19.0	17.0	17.8	5.22	4.77	4.91
1,280	13	2.15	26.0	21.0	23.5	4.75	3.61	4.18
1,372	14	1.58	45.0	25.0	33.2	6.64	3.64	5.20
610	16	1.62	43.0	31.0	37.3	5.53	4.62	5.05
501	15	1.7	-----	-----	41.0	-----	-----	3.93
480	17	1.5	-----	-----	40.0	-----	-----	5.17
60,144	.....	2.47	-----	-----	18.6	-----	-----	3.62
10,153 broilers.....		1.58	-----	-----	26.9	-----	-----	3.91
22,256 roasters.....		3.15	-----	-----	13.5	-----	-----	3.56

TABLE 2.—*Summary of Experiment A, 1911, Section 3, arranged according to length of feeding period—Continued.*

Number of head.	Total cost of feed per pound of gain.			Cost of labor per pound of gain.			Total cost per pound of gain.		
	High.	Low.	Average.	High.	Low.	Average.	High.	Low.	Average.
2,096	<i>Cents.</i>	<i>Cents.</i>	<i>Cents.</i>	<i>Cents.</i>	<i>Cents.</i>	<i>Cents.</i>	<i>Cents.</i>	<i>Cents.</i>	<i>Cents.</i>
13,587	10.96	3.82	7.38	1.72	0.77	1.18	12.68	4.59	8.56
6,063	10.93	6.24	7.99	1.53	.82	1.13	12.46	7.23	9.12
12,925	11.23	5.40	8.19	2.18	.91	1.41	12.73	6.46	9.60
11,160	9.29	5.49	7.00	2.60	.77	1.29	11.23	6.27	8.29
7,030	15.01	5.66	7.31	3.65	1.02	1.46	16.66	6.76	8.77
3,040	9.45	8.70	9.02	1.62	1.49	1.56	11.07	10.19	10.58
1,280	8.83	7.14	7.99	1.60	1.39	1.49	10.43	8.53	9.49
1,372	15.50	8.48	12.17	2.11	1.33	1.71	17.61	9.81	13.88
610	12.87	12.40	12.65	1.84	1.63	1.73	14.71	14.03	14.38
501	.....	.....	8.66	.....	.....	1.38	.....	.....	10.04
480	.....	.....	12.13	.....	.....	1.80	.....	.....	13.93
60,144	.....	.....	7.83	.....	.....	1.35	.....	.....	9.18
10,153 broilers	.....	.....	8.42	.....	.....	1.52	.....	.....	9.94
22,256 roasters	.....	.....	8.34	.....	.....	1.19	.....	.....	9.53

EXPERIMENT A, 1912.

The ration at Station 3 in 1912 was 3 parts of corn meal and 2 parts of low-grade wheat flour throughout the season, with 25 per cent of shorts added from August 21 to September 8 and with about 6 per cent of mixed feed added during September and November. The shorts and mixed feed gave fair results in warm weather, but no advantage was found when feeding them in cool weather. The specially prepared mixed feeds used in September cost \$2.70 per 100 pounds and were too expensive, but a mixed feed used later in the season cost only \$1.60 per 100 pounds, which compares favorably in price with the other feeds. However, it would probably be advisable to substitute shorts for mixed feeds, as the latter are more apt to be adulterated. Lot 2 was fed 10 per cent of meat in addition to the regular ration, while lot 45 was fed a specially prepared mixture to note the effect of these feeds on feather picking, but no consistent results were obtained in these experiments. This subject is discussed in detail under the heading "Feather picking."

Condensed buttermilk, diluted with water and mixed with grain—13.5 gallons to 100 pounds—was fed throughout the season. This proportion of condensed buttermilk, while increasing the cost of the feeding, gave profitable results, as the general conditions at this station were not conducive to good results in fattening. The proportion of condensed milk to grain was double that used in Experiment C. The broilers and roasters were separated at this station and fed for different lengths of time. The results secured during November were very poor, there being an increased cost of gain compared with 1911.

TABLE 3.—*Summary of Experiment A, 1912, Station 3, arranged according to length of feeding period.*

Number of head.	Days fed.	Average weight.	Per cent of gain.			Grain per pound of gain.		
			High.	Low.	Average.	High.	Low.	Average.
			Pounds.	Per cent.	Per cent.	Per cent.	Pounds.	Pounds.
748	6	3.60			6.0			
5,456	7	3.13	17.0	4.0	11.6	10.53	2.98	5.40
5,640	8	3.14	16.0	5.0	7.70	8.35	3.44	6.85
22,656	9	2.59	23.0	5.0	14.4	9.04	2.84	5.22
18,240	10	2.48	28.0	8.0	18.7	6.67	2.65	3.92
18,480	11	2.26	41.0	6.0	20.4	9.96	2.75	3.87
10,880	12	1.99	40.0	13.0	26.0	4.02	3.11	3.51
4,160	13	1.89	31.0	21.0	26.9	4.46	2.75	3.49
3,200	14	1.88	37.0	30.0	33.6	4.69	2.98	3.64
288	15	1.63			3.0			5.07
321	21	2.26			35.0			4.27
90,069		2.44			18.6			4.42
10,852 broilers		1.69			25.7			3.80
23,490 roasters		3.24			9.2			6.83
Number of head.	Total cost of feed per pound of gain.			Cost of labor per pound of gain.			Total cost per pound of gain.	
	High.	Low.	Average.	High.	Low.	Average.	High.	Low.
	Cents.	Cents.	Cents.	Cents.	Cents.	Cents.	Cents.	Cents.
748			9.60			1.91		
5,456	19.35	5.42	9.13	4.02	1.06	1.79	23.37	6.55
5,640	15.77	6.63	12.87	3.11	1.15	2.44	18.88	7.78
22,656	17.46	5.48	9.81	3.43	.95	1.82	20.89	6.40
18,240	12.94	5.09	7.67	2.13	.84	1.31	15.07	6.11
18,480	19.29	5.56	8.78	3.78	.92	1.70	23.07	6.48
10,880	8.14	6.39	7.01	1.70	1.11	1.43	9.67	7.55
4,160	8.84	5.67	6.93	1.59	1.17	1.43	10.37	6.84
3,200	9.01	6.06	7.22	1.52	1.09	1.27	10.53	7.30
288			9.37			1.82		
321			8.51			1.39		
90,069			8.74			1.63		
10,852 broilers			7.37			1.60		
23,490 roasters			12.85			2.42		

EXPERIMENT B, 1911.

The total number of chickens fed in this experiment at Station 1 was 102,684, the birds being divided into 113 lots, most of which were on feed from 12 to 16 days. The results secured were very satisfactory, the lots doing especially well until the month of October, when there was a marked falling off in gains. The feeding period was about 14 days until the gains fell off, when the period was shortened because the 14-day feeding was unprofitable, while the birds made as high or higher gains during a shorter feeding period. The "roasters" and "broilers" were not separated at this station, and all of the lots were classed as "springs" except a few in July when the average weight of the birds was under 1.8 pounds.

The equipment, management, and method of feeding at Station 1 are described in Bulletin 140. The ration was varied during the summer season in the following way:

FEED.

Lots 1 to 13 received a ration averaging 1 part shorts, 2 of low-grade flour, and 2.5 corn meal, but these proportions were varied somewhat. Lots 1 to 3 did not receive any tallow. In all the rest of the lots 6 per cent of the dry feed was tallow, although lots 4 to 17 did not receive tallow during their entire feeding period. The feed for all the lots was mixed in one tank at the same time.

Tallow increased the cost of gains considerably, but did not increase the gains in proportion to the extra cost. The tallow apparently increases the gains slightly and makes the fat appear more distinctly on the birds. Many buyers judge the condition of the birds partly by the prominence of this fat, so that it may be wise to feed a small proportion of tallow in some cases. Tallow was not fed at any of the other stations included in these records. These other companies had built up a reputation for such good poultry that they were able to sell their products as high, if not higher, than those produced by the company using tallow. On the whole there does not appear to be any advantage in feeding tallow at present prices except as it affects the appearance and the sale of the product, which depends both on the market and the reputation of the producer.

OAT FLOUR.

Lots 14 to 30 received 1 part of shorts, 1 of low-grade flour, and 1.5 parts of corn meal, with 6 per cent tallow. Lots 30 to 43 received equal parts of oat flour, low-grade wheat flour, and corn meal, which proved to be a very efficient ration, producing gains with slightly less feed but at a higher cost, because of the difference between the price of oats and of low-grade flour or shorts. Oats are one of the best fattening feeds and produce very good gains, but they do not equal low-grade wheat flour at the present price of grains. Oats which were ground and reground without removing the hulls were tried on a small scale toward the end of the feeding season with satisfactory results. Both hens and large chickens ate oats thus prepared without any ill effects, and made gains. It is possible that the hulls might injure young, tender chickens, but this can only be proved by feeding. If a feeder can procure reground oats containing hulls at a price not much greater than that of low-grade wheat flour they are one of the best feeds, as they produce a good quality of flesh and can be used efficiently in fattening poultry. A ration composed of one-fourth oats, one-fourth low-grade flour, and one-half corn meal would give very good results during the first part of the feeding season, and the proportion of corn meal could be gradually increased later in the season during cool or cold weather.

BEEF SCRAP.

Lots 44 to 70 received 1 part of shorts, 2 of low-grade flour, and 3.5 of corn meal, with 6 per cent of tallow. Lots 71 to 100 received 1 part of shorts, 3 of low-grade flour, and 10 of corn meal, with 6 per cent of tallow. Lots 101 to 113 received 1 part of shorts, 1 of low-grade flour, and 2 of corn meal, with 6 per cent of tallow. Lots 92, 94, and 95 received two-thirds of a pound of good quality dried meat scraps per 100 head, which amount of meat did not seem to affect either the gain or the cost of gain. The birds ate the feed well, but not any better than the lots which did not receive beef scrap.

There does not appear to be any advantage in adding beef scrap to the regular ration if it contains plenty of milk. Beef scrap would probably be economical in a ration without milk, or where only a small amount of milk was available. Fresh meat was added to the fattening rations at several other packing houses in this State. In these cases the poultry houses were a part of a meat-packing establishment, so that a supply of the best quality of meat was regularly available for feeding. Very good results were secured in feeding this meat in a ration containing 60 per cent of steel-cut oats, 40 per cent of corn meal, with about 7 per cent of tallow added.

TABLE 4.—*Summary of Experiment B, 1911, Station 1, arranged according to length of feeding period.*

Number of head.	Days fed.	Average weight.	Per cent of gain.			Grain per pound of gain.		
			High.	Low.	Average.	High.	Low.	Average.
			Pounds.	Per cent.	Per cent.	Per cent.	Pounds.	Pounds.
1,350	10	3.50			9.0			4.63
1,800	11	3.40	17.0	7.0	12.0	6.86	2.83	4.85
10,884	12	3.10	31.0	9.0	17.7	5.67	2.40	3.71
17,100	13	2.69	48.0	8.0	24.9	6.72	2.01	3.18
43,200	14	2.60	49.0	9.0	26.2	8.23	2.12	3.28
14,850	15	2.48	41.0	11.0	28.8	6.03	2.40	3.23
9,900	16	2.04	48.0	25.0	33.3	4.18	2.57	3.17
3,600	17	1.75	47.0	33.0	37.5	3.55	2.93	3.29
102,684	.....	2.56	.....	.....	26.0	.....	.....	3.33
4,500 broilers	.....	1.62	.....	.....	42.8	.....	.....	2.79

Number of head.	Total cost of feed per pound of gain.			Cost of labor per pound of gain.			Total cost per pound of gain.		
	High.	Low.	Average.	High.	Low.	Average.	High.	Low.	Average.
	Cents.	Cents.	Cents.	Cents.	Cents.	Cents.	Cents.	Cents.	Cents.
1,350			9.31			3.03			12.54
1,800	15.94	6.61	11.28	5.34	1.98	3.66	21.28	8.59	14.94
10,884	13.45	5.70	8.59	3.70	1.36	2.32	17.15	7.07	10.91
17,100	14.70	4.75	7.30	4.71	1.28	2.11	19.41	6.03	9.41
43,200	18.00	4.38	6.99	4.00	1.09	1.85	22.00	5.81	8.84
14,850	13.47	5.51	6.59	4.04	1.37	2.40	17.51	6.88	8.99
9,900	8.28	4.75	6.35	2.69	1.39	1.88	10.97	6.14	8.23
3,600	6.60	5.38	6.01	1.97	1.58	1.80	8.56	6.96	7.81
102,684	.....	.....	7.20	.....	.....	2.00	.....	.....	9.20
4,500 broilers	.....	.....	5.09	.....	.....	1.58	.....	.....	6.67

A study of Table 4 shows that the cost of gains increased as the season advanced, due both to the increased size of the birds and to less favorable weather conditions for fattening. The greatest and cheapest gains were made on small birds during the summer and early fall. Very hot weather increased the cost of gains slightly, while cold, cloudy, changeable weather in the fall raised the cost materially. Except for a few minor fluctuations, due to extremely hot weather, the cost of gains was comparatively steady during July, August, and September, after which time it increased quite rapidly. Broilers made the highest, cheapest gains. One lot of roasters (lot 82) which weighed 5 pounds to the bird gained only 9 per cent, while the total cost of a pound of gain was 11.97 cents. The average gain of the broilers was 42.8 per cent, and the average cost of gain 6.67 cents a pound. The lots containing the greatest per cent of light-weight chickens made the cheapest gains, while the average cost of gains varied inversely with the average weight of the lots.

The gain per 100 head in fattening may be shown in two ways—by the per cent of gain or by the gain in actual weight. The per cent of gain throughout the feeding season varies inversely with the average weight of the lots, so that a gain of 30 per cent on a lot averaging 1.5 pounds per head is no greater in actual pounds than a gain of 15 per cent on a lot of the same number of birds weighing 3 pounds per head. The total gain per 100 head is more constant throughout the feeding season, and on that account this method of recording gains is preferred by some companies, as the average weight of the birds does not have to be known when comparing the gains at different periods.

EXPERIMENT B, 1912.

The ration by months in 1912 at Station 1 was as follows: August, 1 part of shorts, 2 parts of low-grade wheat flour, 4 parts of corn meal, and 5 per cent of tallow, mixed with 72.5 per cent of buttermilk; September, 1 part of shorts, 2.5 parts of low-grade wheat flour, 4.5 parts of corn meal, and 5 per cent of tallow, mixed with 68 per cent of buttermilk; October and November, 1 part of shorts, 4 parts of low-grade wheat flour, 5 parts of corn meal, and 5 per cent of tallow, with 63 per cent of buttermilk. In general the proportion of shorts to low-grade wheat flour decreased, while the proportion of low-grade wheat flour to corn meal increased as the season progressed. This ration is quite similar to the one used during part of the season of 1911 at this station, and also to the one used in Experiment C at Station 4, except that it contains 5 per cent of tallow, which was not fed at Station 4. A much larger per cent of buttermilk was used in mixing the ration at this station than at Station 4 during the warm weather. This larger per cent of buttermilk appears to be especially advantageous in warm weather. A small amount of oatmeal, which was infested with

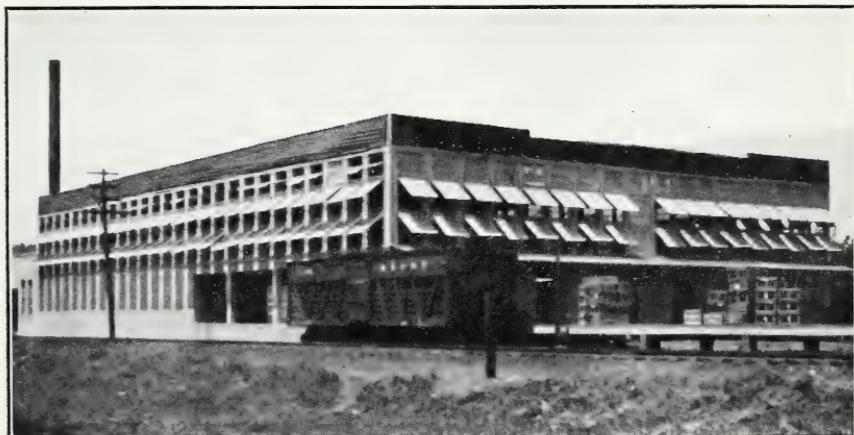


FIG. 1.—FEEDING STATION NO. 4, A WELL-EQUIPPED PLANT.

Note complete ventilation, easily controlled.

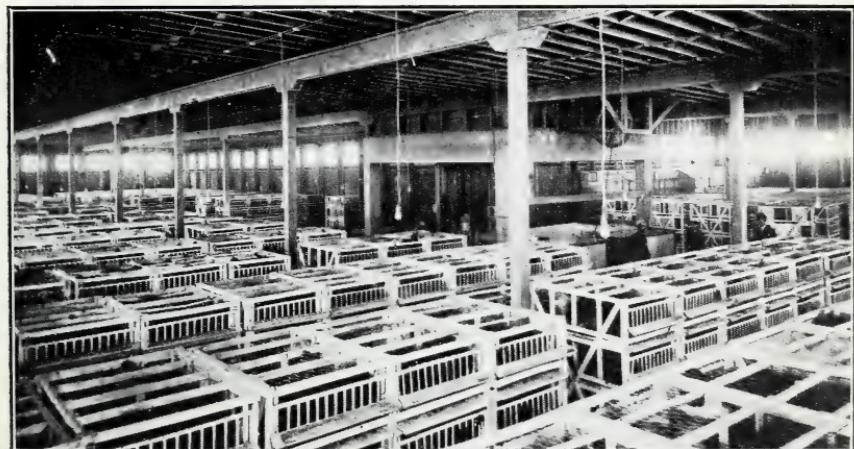


FIG. 2.—INTERIOR OF STATION NO. 4, SHOWING GENERAL ARRANGEMENT, FEED MIXERS,
AND ELEVATOR

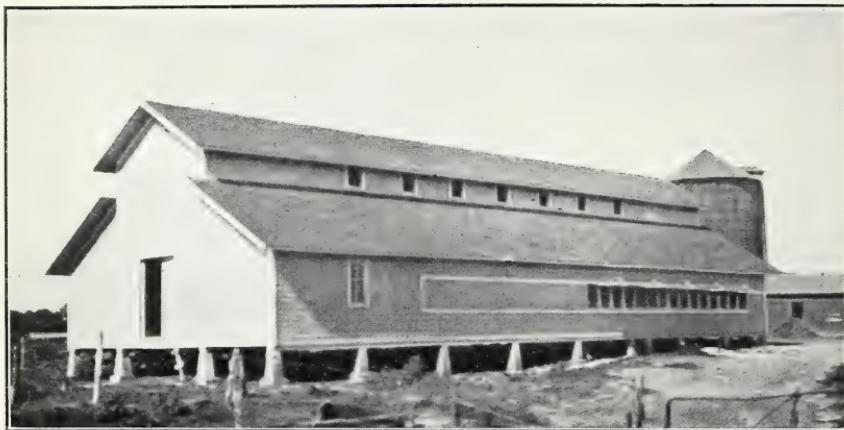


FIG. 1.—A SMALL FATTENING STATION WITH FEED ROOM IN THE REAR.



FIG. 2.—STATIONARY FEEDING BATTERY USED IN FEEDING STATION NO. 1.

weevils, was bought at \$1.50 per 100 pounds, and fed with good results to four lots in this experiment. Oatmeal gives slightly greater gains than low-grade wheat flour, but does not produce as economical gains at the present relative market prices of these two grains.

The broilers and roasters were not separated at this station, but the average cost of gain at this station would undoubtedly have been reduced after the middle of October if the lots had been fed for a shorter period. The longer feeding at that time of the year produced a better quality of flesh, but at a rather excessive cost compared with the cost earlier in the season on smaller chickens. No cripples or birds off feed were removed from the lots during this year, as has been the custom in previous seasons. The results for the season were very satisfactory.

TABLE 5.—Summary of Experiment B, 1912, Station 1, arranged according to length of feeding period.

Number of head.	Days fed.	Average weight.	Per cent of gain.			Grain per pound of gain.		
			High.	Low.	Average.	High.	Low.	Average.
900	9	Pounds.	Per cent.	Per cent.	Per cent.	Pounds.	Pounds.	Pounds.
5,400	10	3.60	2.73	28.0	4.0	13.7	10.19	2.36
2,700	11	2.55	2.55	34.0	10.0	19.7	5.00	1.94
5,400	12	2.52	2.52	31.0	14.0	22.2	4.55	2.35
17,100	13	2.10	2.10	51.0	14.0	30.1	5.35	1.89
27,900	14	2.22	2.22	52.0	10.0	29.6	7.38	2.07
10,800	15	2.51	2.51	35.0	15.0	23.4	5.37	2.83
10,800	16	2.57	2.57	34.0	19.0	25.3	4.25	2.69
5,400	17	2.43	2.43	45.0	22.0	29.7	4.31	2.69
3,600	18	2.34	2.34	38.0	32.0	34.8	3.56	3.12
90,000	.....	2.36	.....	.....	26.7	.....	.....	3.58
Number of head.	Total cost of feed per pound of gain.			Cost of labor per pound of gain.			Total cost per pound of gain.	
	High.	Low.	Average.	High.	Low.	Average.	High.	Low.
900	Cents.	Cents.	Cents.	Cents.	Cents.	Cents.	Cents.	Cents.
5,400	20.49	5.71	11.57	6.25	1.57	3.51	26.74	7.28
2,700	10.06	4.68	7.29	3.05	1.44	2.10	13.11	6.12
5,400	9.14	5.70	6.85	2.19	1.48	1.70	11.33	7.18
17,100	10.76	4.57	6.57	2.33	1.18	1.65	13.09	5.75
27,900	14.84	5.00	7.08	3.50	1.14	2.10	18.34	6.19
10,800	10.79	6.51	8.75	2.52	1.66	2.04	13.31	8.17
10,800	9.77	5.75	8.31	2.28	1.13	1.80	12.23	6.88
5,400	9.21	6.18	8.05	2.18	1.41	1.68	11.39	7.39
3,600	7.62	7.17	7.35	1.50	1.41	1.46	9.12	8.88
90,000	.....	.....	7.70	.....	.....	1.99	.....	9.69

EXPERIMENT C, 1911.

This experiment was conducted at Station 4, of which exterior and interior views are shown in Plate I. The number of birds fed during the season totaled 117,151, which included 17,330 broilers and 55,010 roasters. The results for all the birds are summarized in Table 6 according to number of days fed, and the average results for the broilers and roasters, irrespective of length of feeding period, are shown separately as in the other experiments.

FEED.

A ration composed of about 1 part of shorts, 2 of low-grade flour, and 3 of corn meal was fed until August 12, when it was changed to 1 part of shorts, 1 of flour, and 2 of meal. On August 23 another change was made to 1 of shorts, 2 of flour, and 4 of meal, which was again changed on October 8 to 1 of shorts, 3 of flour, and 9 of meal, which was fed to the end of the season. The gains and cost were quite consistent, as the variation was due largely, if not entirely, to conditions other than feed. Chickens will use a larger per cent of corn meal more efficiently during cool weather, as the feeding season progresses. These records show a marked decrease in gains during the hot weather in August, and an extremely high cost of gains during November and December. The poor results obtained in August were due partly to overcrowding and perhaps partly to feeding a mixture which was too thick during the extremely hot weather.

TABLE 6.—Summary of Experiment C, 1911, Station 4, arranged according to length of feeding period.

Number of head.	Days fed.	Average weight.	Per cent of gain.			Grain per pound of gain.		
			High.	Low.	Average.	High.	Low.	Average.
3,326	7	Pounds.	Per cent.	Per cent.	Per cent.	Pounds.	Pounds.	Pounds.
6,140	8	3.22	8.0	3.0	4.6	10.82	5.18	9.03
9,830	9	2.90	25.0	8.0	13.6	5.40	1.96	3.91
15,342	10	3.01	18.0	5.0	12.2	9.43	3.12	4.79
16,864	11	2.91	25.0	3.0	14.5	14.76	2.31	5.13
32,493	12	2.75	37.0	9.0	18.9	7.22	2.42	4.06
10,802	13	2.43	34.0	5.0	19.6	30.56	1.49	4.85
17,298	14	1.88	39.0	12.0	25.9	5.86	2.69	3.79
5,056	15	1.84	50.0	17.0	33.0	5.69	2.25	3.25
		1.99	44.0	25.0	29.5	4.41	3.23	3.55
117,151	.....	2.48	.....	.....	20.4	.....	.....	4.45
17,330 broilers	.....	1.60	.....	.....	34.9	.....	.....	3.69
55,010 roasters	.....	3.05	.....	.....	14.0	.....	.....	5.50

Number of head.	Total cost of feed per pound of gain.			Cost of labor per pound of gain.			Total cost per pound of gain.		
	High.	Low.	Average.	High.	Low.	Average.	High.	Low.	Average.
3,326	Cents.	Cents.	Cents.	Cents.	Cents.	Cents.	Cents.	Cents.	Cents.
6,140	17.04	8.14	14.25	4.04	2.14	3.33	20.56	10.28	17.85
9,830	8.59	3.44	6.23	2.90	.76	1.45	11.49	4.20	7.68
15,342	15.94	5.48	7.74	4.80	1.20	1.92	19.84	6.68	9.66
16,864	28.27	3.92	8.19	9.03	.89	2.15	37.30	4.81	10.34
32,493	11.33	4.06	6.68	2.39	.89	1.43	13.72	4.95	8.11
10,802	49.00	3.84	7.91	13.52	.98	1.96	62.52	4.82	9.87
17,298	9.91	4.20	6.23	2.34	1.19	1.65	11.92	5.49	7.88
5,056	9.12	3.62	4.80	4.30	.98	1.54	13.04	5.29	6.34
	7.08	5.77	6.04	1.65	1.23	1.50	8.58	7.03	7.54
117,151	.....	.....	7.15	.....	.....	1.81	.....	.....	8.96
17,330 broilers	.....	.....	5.98	.....	.....	1.63	.....	.....	7.61
55,010 roasters	.....	.....	8.83	.....	.....	2.12	.....	.....	10.95

Table 6 shows the common custom of separating roasters and broilers, feeding the former for short periods and the latter for a longer time. The broilers produced cheaper gains with less feed than the roasters, the average total cost per pound of gain being 1.89 cents less. Weather conditions were more favorable when most of the broilers were fed, which gives them an advantage over the roasters. Broilers fed during cool weather in summer produced the cheapest gains, but the gains later in the season, though cheaper than those produced by roasters, were much higher than earlier in the season, because a large number of the broilers were stunted and the weather conditions unfavorable.

The very marked increase in cost of gains in this experiment during November and December shows plainly the effect of weather conditions on the birds and the unprofitableness of feeding when this happens. It may be seen from Table III of the appendix that an unusually large proportion of dead birds are recorded in this experiment toward the close of the season. Comparing the results at this station with those obtained in Experiment D at Station 2, we find that the average gain and the amount of feed per pound of gain was the same for the season, while the cost was slightly greater at the latter station, due to the higher cost of the buttermilk. Condensed buttermilk diluted with 1½ parts of water was used in Experiment D, while the regular buttermilk, which was used in Experiment C, cost only 1½ cents per gallon. The proportion of corn meal in the ration was increased in cool weather without any injurious effects, but a study of the results indicates that a smaller per cent of corn meal in the ration produced cheaper gains.

EXPERIMENT C, 1912.

The ration at Station 4 in 1912 varied considerably during the season but on the whole was quite similar to that used in 1911, except that a smaller proportion of shorts was used throughout the season while a larger proportion of low-grade wheat flour was used during the latter part of the season. From 1 to 2 per cent of meat and bones was fed during the last half of June, throughout August and during the first half of September. The ration by months was as follows: July, 1 part of shorts, 3 parts of low-grade wheat flour, 6.5 parts of corn meal, mixed with 65 per cent of buttermilk; August, 1 part of shorts, 2 parts of low-grade wheat flour, 4 parts of corn meal, mixed with 67.5 per cent of buttermilk; September, 1 part of shorts, 4 parts of low-grade wheat flour, 7 parts of corn meal, mixed with 62 per cent of buttermilk; October, 1 part of shorts, 5 parts of low-grade wheat flour, 6.5 parts of corn meal, mixed with 62 per cent of buttermilk; November, 1 part of shorts, 6.5 parts of low-grade wheat flour, 11 parts of corn meal, mixed with 62 per cent of buttermilk.

The lots which averaged to weigh less than $1\frac{3}{4}$ pounds per bird were classed as broilers during the first part of the feeding season and the broilers and roasters were separated and fed different feeding periods after the 1st of October.

TABLE 7.—*Summary of Experiment C, 1912, Station 4, arranged according to length of feeding period.*

Number of head.	Days fed.	Average weight.	Per cent of gain.			Grain per pound of gain.			
			High.	Low.	Average.	High.	Low.	Average.	
			Pounds.	Per cent.	Per cent.	Per cent.	Pounds.	Pounds.	
11,360	7	2.47	18.0	14.0	16.2	3.69	2.64	3.00	
25,600	8	2.46	22.0	12.0	18.5	4.28	2.75	3.10	
17,360	9	2.57	29.0	9.0	18.5	5.88	2.78	3.51	
27,440	10	2.22	30.0	10.0	20.1	5.83	2.39	3.42	
30,880	11	2.28	34.0	12.0	20.4	5.19	2.72	3.75	
41,320	12	2.13	40.0	6.0	20.2	12.60	2.58	4.50	
24,640	13	1.93	37.0	7.0	22.9	7.83	2.75	4.24	
6,800	14	1.65	39.0	25.0	28.8	4.95	2.80	3.64	
2,720	15	1.70	37.0	27.0	32.7	5.41	3.03	3.83	
2,800	16	1.66	38.0	23.0	33.0	4.78	3.18	3.96	
211,560	.....	2.21	.....	.....	20.7	.....	.....	3.72
43,120 broilers	.....	1.64	.....	.....	26.8	.....	.....	4.02
26,880 roasters	.....	3.10	.....	.....	11.7	.....	.....	5.73
Number of head.	Total cost of feed per pound of gain.			Cost of labor per pound of gain.			Total cost per pound of gain.		
	High.	Low.	Average.	High.	Low.	Average.	High.	Low.	
	Cents.	Cents.	Cents.	Cents.	Cents.	Cents.	Cents.	Cents.	
11,360	6.39	4.67	5.33	1.05	0.82	0.89	7.44	5.49	6.22
25,600	7.64	4.84	5.49	1.21	.77	.88	8.85	5.61	6.37
17,360	10.47	4.88	6.22	1.85	.75	.99	12.32	5.63	7.21
27,440	9.73	4.18	6.13	2.10	.80	1.33	11.80	5.02	7.46
30,880	9.14	4.80	6.63	1.74	.88	1.31	10.73	5.68	7.94
41,320	23.89	4.62	7.93	6.37	1.01	1.75	30.26	5.63	9.68
24,640	13.80	4.93	7.54	2.52	1.04	1.68	16.32	6.01	9.22
6,800	8.09	5.03	6.51	2.91	1.09	1.55	10.30	6.12	8.06
2,720	9.64	5.52	6.92	2.36	1.70	2.14	11.34	7.83	9.06
2,800	8.52	5.82	7.20	2.87	1.47	2.12	11.34	7.78	9.32
211,560	6.61	1.37	7.98
43,120 broilers	7.25	1.74	8.99
26,880 roasters	9.78	1.89	11.67

EXPERIMENT D, 1911.

The results of this experiment at Station 2 were quite even throughout the season, except that during the month of November there was a marked increase and great variation in the cost of gains. The lots were handled like those in Experiment C, except that roasters were fed 7 or 8 days, while broilers were on feed 14 days. This method is open to criticism because cheaper gains are produced by gradually decreasing the length of the feeding period on roasters, reaching 7 or 8 days about the middle of October, than by changing from 14 directly to 7 or 8 days as soon as the lots are separated into roasters and broilers. However, much depends on the weather conditions, on the market, and on the economy of labor in the feeding station.

FEED.

The ration throughout the season consisted of 3 parts of corn meal, 2 parts of low-grade flour, and 5 per cent of shorts, mixed with condensed buttermilk diluted with 1½ parts of water. The results plainly show that these proportions of corn meal and flour make a very satisfactory ration throughout the feeding season. The condensed buttermilk undoubtedly offsets the corn meal in this ration during hot weather, so that it is more satisfactorily fed with thick condensed buttermilk than if mixed with the ordinary buttermilk.

TABLE 8.—*Summary of Experiment D, 1911, Station 2, arranged according to length of feeding period.*

Number of head.	Days fed.	Average weight.	Per cent of gain.			Grain per pound of gain.			
			High.	Low.	Average.	High.	Low.	Average.	
9,174	6	Pounds.	Per cent.	Per cent.	Per cent.	Pounds.	Pounds.	Pounds.	
14,670	7	3.31	9.0	2.0	7.4	14.31	3.45	5.25	
35,462	8	3.20	13.0	2.0	9.2	16.74	3.15	5.58	
11,012	9	2.96	19.0	8.0	13.4	6.24	2.68	3.93	
5,570	10	2.89	22.0	7.0	14.8	6.96	2.62	4.01	
2,172	13	2.40	25.0	12.0	20.1	4.92	2.72	3.35	
15,230	14	2.21	37.0	28.0	29.7	4.09	2.89	3.11	
11,810	15	1.94	42.0	19.0	30.4	5.54	2.85	3.82	
3,340	16	1.97	41.0	23.0	30.2	5.13	2.92	3.71	
1,360	17	1.80	32.0	26.0	27.4	4.21	3.73	4.10	
					37.0			3.38	
109,800	.....	2.68	.....	.....	18.0	.....	.....	4.18
11,500 broilers	.....	1.79	.....	.....	36.9	.....	.....	4.27
71,928 roasters	.....	3.04	.....	.....	12.0	.....	.....	4.48
Total cost of feed per pound of gain.			Cost of labor per pound of gain.			Total cost per pound of gain.			
Number of head.	High.	Low.	Average.	High.	Low.	Average.	High.	Low.	
9,174	Cents.	Cents.	Cents.	Cents.	Cents.	Cents.	Cents.	Cents.	
14,670	30.86	7.48	11.12	6.72	1.34	2.27	37.58	8.89	13.39
35,462	35.31	6.79	11.63	6.80	1.15	2.04	42.11	8.05	13.67
11,012	13.60	5.59	8.31	2.31	.95	1.40	15.37	6.54	9.71
5,570	14.47	5.26	8.51	2.50	1.01	1.44	16.97	6.27	9.95
2,172	9.98	5.31	6.77	1.81	.98	1.22	11.94	6.30	7.99
15,230	12.29	5.67	6.37	1.93	1.14	1.24	11.91	6.93	7.61
11,810	10.87	5.76	7.80	2.26	1.06	1.43	14.55	6.73	9.23
3,340	8.43	7.35	7.49	1.73	1.11	1.42	12.56	6.87	8.91
1,360	6.63	1.29	7.92
109,800	8.71	1.56	10.27
11,500 broilers	8.87	1.57	10.44
71,928 roasters	9.42	1.66	11.08

EXPERIMENT D, 1912.

The ration at Station 2 in 1912 was similar to that used in 1911, except that 2 to 3 per cent of bone and waste meat was fed at irregular intervals until the middle of September. A slightly larger (from 5 to 10) per cent of shorts was fed during 1912 after the middle of September, while this same per cent of a mixture of shorts and graham flour

was used up to that time. The supply of condensed buttermilk was very limited, so that it was necessary to dilute it with a larger per cent of water as the feeding season advanced. The amount of condensed buttermilk fed per 100 pounds of grain was as follows: 10 gallons in August, 7 gallons in September, 4.5 gallons in October, and 3.3 gallons in November. The rather poor results secured at this station during the last part of the season may have been partly due to this lack of buttermilk, but the results were quite variable throughout the entire season.

The cost of feed was considerably higher in 1912 than in 1911. The broilers and roasters were not separated at this station during this feeding season. The high cost of the gains during October on lots fed from 11 to 15 days would indicate that the common practice of dividing the lots into broilers and roasters about the 1st of October and gradually reducing the length of the feeding period of the latter was more profitable than to feed roasters for 14 days after the 1st of October.

TABLE 9.—*Summary of Experiment D, 1912, Station 2, arranged according to length of feeding period.*

Number of head.	Days fed.	Average weight.	Per cent of gain.			Grain per pound of gain.			
			High.	Low.	Average.	High.	Low.	Average.	
		Pounds.	Per cent.	Per cent.	Per cent.	Pounds.	Pounds.	Pounds.	
14,632	6	3.35	15.0	5.0	7.5	7.22	2.67	5.37	
8,986	7	3.04	21.0	6.0	12.4	7.88	2.52	4.58	
8,032	8	2.78	26.0	6.0	13.2	7.81	2.20	5.29	
6,748	9	2.98	26.0	7.0	12.1	6.59	2.46	5.15	
14,018	10	2.55	24.0	9.0	20.6	6.76	3.40	3.99	
24,830	11	2.45	27.0	6.0	17.8	12.33	2.70	4.65	
7,056	12	2.54	23.0	9.0	15.9	8.69	3.02	5.22	
5,610	13	2.79	18.0	7.0	15.1	11.70	4.04	6.18	
7,320	14	2.38	23.0	13.0	18.4	8.15	2.83	5.34	
5,340	15	2.43	25.0	8.0	17.5	11.64	3.74	6.66	
3,840	16	1.87	30.0	22.0	25.8	4.99	3.79	4.38	
640	17	1.73	.....	.....	35.0	.....	.....	3.78
107,052	.....	2.69	.....	.....	15.7	.....	.....	4.98
Number of head.	Total cost of feed per pound of gain.			Cost of labor per pound of gain.			Total cost per pound of gain.		
	High.	Low.	Average.	High.	Low.	Average.	High.	Low.	
	Cents.	Cents.	Cents.	Cents.	Cents.	Cents.	Cents.	Cents.	
14,632	13.82	5.22	9.90	3.16	0.77	2.08	16.87	5.99	11.98
8,986	13.60	5.17	8.10	2.99	0.78	1.38	16.59	5.95	9.48
8,032	14.60	4.79	10.15	3.28	0.78	1.78	17.88	5.57	11.98
6,748	11.37	5.51	11.59	1.81	1.00	1.54	13.13	6.54	13.13
14,018	12.90	6.82	7.99	1.98	0.81	0.99	14.88	7.63	8.98
24,830	22.75	6.14	9.68	3.64	1.16	1.56	26.22	7.30	11.24
7,056	15.58	6.83	10.27	2.27	1.16	1.66	17.85	8.03	11.93
5,610	27.20	9.21	11.78	4.50	1.31	1.64	31.70	10.75	13.42
7,320	15.60	6.48	11.21	2.19	1.12	1.70	17.62	7.60	12.91
5,340	21.56	8.73	13.05	2.92	1.38	1.98	24.48	10.11	15.03
3,840	11.67	8.90	11.21	1.83	1.36	1.59	13.50	10.26	12.80
640	8.78	1.36	10.14
107,052	9.95	1.59	11.54	

DETAILS CONCERNING THE FEEDING.**LENGTH OF THE FATTENING PERIOD.**

No comparison can well be made from these tables between the lots fed different lengths of time. For instance, in Experiment B (Table 4) the 17-day lots show the cheapest gains, and the cost of gains happened to increase as the length of the feeding period decreased; but this was due either to the difference in the weight of the birds or to the time of the year when they were fed, and not to the number of days fed. The small birds were fed for the longer feeding periods and during the best weather for fattening, while the large birds were fed for the shorter periods, during the poorest part of the feeding season, which condition produced the cheapest gains on the lots fed for the longest feeding periods. The cost of gain on a given lot increases directly with the length of the feeding period.

In this experiment shortening the length of feeding earlier in the fall would undoubtedly have cheapened the cost of gain, but as the manager wanted to produce an especially fine quality of flesh, he considered it advisable to feed for the longer period while the chickens did well in the feeder. When the results showed that the lots were losing by being kept on feed 14 days, the period was shortened as quickly as possible without complicating the labor problem in the packing house. This shows the need of planning for the increased cost of gain in the fall, and preparing for it by shortening the length of feeding previous to the period of low gains, as the labor can not be handled economically if an abrupt change is made.

Again, in Experiment C the best length of feeding period can not be determined from a comparative study of the feeding, on account of a variation in the size of the birds and in the weather conditions for lots fed the same number of days. A comparison of the results at the various stations shows that the common practice of feeding broilers and springs for about 14 days during the first part of the feeding season and separating the lots of roasters and broilers about the middle of September, while gradually reducing the feeding period of the roasters, is the most profitable practice, unless there is a special reason for feeding the lots longer in the fall.

FEEDING TWICE AS AGAINST THREE TIMES DAILY.

Comparing the feeding results secured in Table 4 (Experiment B, Station 1) with those in the other tables, we find that the feed at this station was apparently more efficient than at any of the other stations. Practically the same gains were secured, both with less daily consumption of feed and less feed per pound of gain. Various factors might have influenced these results, but it would appear that by feeding twice instead of three times daily the grain was used more efficiently

in producing gains. At Station 1 during the greater part of the season the birds received a light feed in the morning and a heavy feed at night, thus getting the bulk of their feed in one meal. Some small tests in cramming, the results of which were not recorded, produced very good results by feeding only once daily. The advantage of feeding twice as against three times daily depends on other factors as much as on the efficiency of the use of feed, so that each feeder must decide that question for himself. Very good results can be secured by either method. There appears to be less danger of overfeeding when feeding only twice daily, but a more experienced feeder is required to regulate the amount to feed in two meals than in three in order to get the greatest amount of feed into the bird. Apparently under average conditions the birds will consume more feed in three meals daily, but will use their feed more efficiently if fed twice, provided that they receive enough feed.

THE USE OF CONDIMENTAL FEEDS.

A commercial preparation claimed by the manufacturers to stimulate the appetites of birds which are being fattened was fed in Experiment B to lots 1 to 12. Later in the season the test was repeated by feeding this preparation to lots 23 to 37. It did not appear to stimulate the birds' appetites, as the gains of other lots, fed before and after those which received this substance, did not show there was any advantage in feeding it.

Oil of aniseed mixed with pure carbolic acid, and fed at the rate of one tablespoonful to every 2,000 birds, had been used by one of the feeders in some previous work. It was claimed to have increased the appetite of the birds, but it made the bones brittle, so that its use prevented good dressing.

THE USE OF SALT AND GRIT.

Fine salt was fed in Experiments C and D at the rate of 4 pounds of salt to 10,000 head, without producing any apparent results. The feeders at these stations believed that salt in the feed kept the birds from picking each other, so that when this vice is prevalent it may pay to feed salt, otherwise there is no advantage in adding salt to the ration.

Grit was given to the birds in Experiment B twice weekly during the first month of the feeding season, but no grit was fed at any of the other stations. At the end of the month the feeding of grit was stopped without any apparent effect, and was not fed any more during the season. Birds in good health which are fattened not longer than 16 days do not need grit, as grit increases the cost of feed and labor without producing better gains.

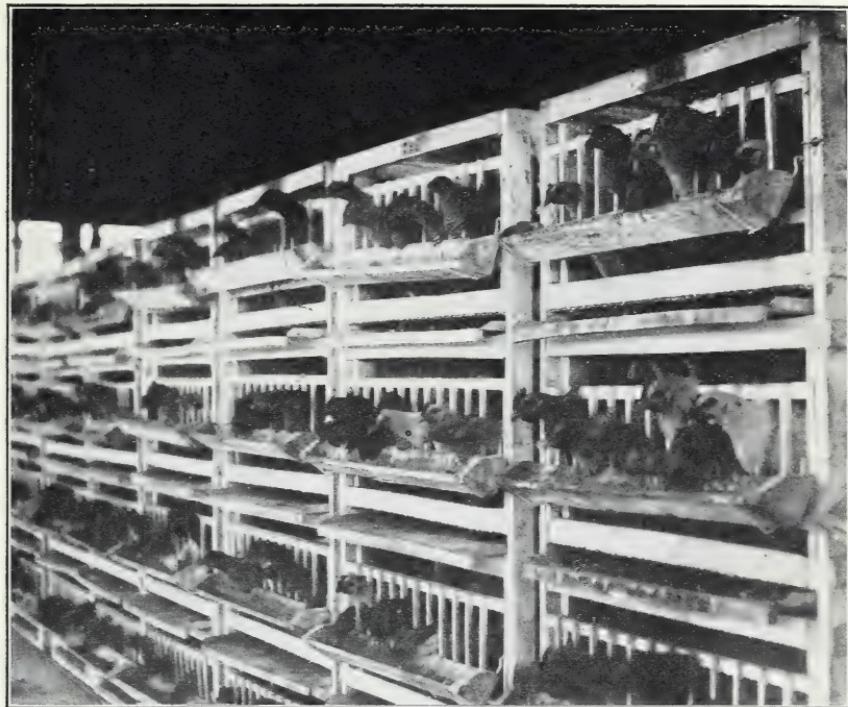


FIG. 1.—CHICKENS IN FEEDING BATTERIES WAITING TO BE FED.

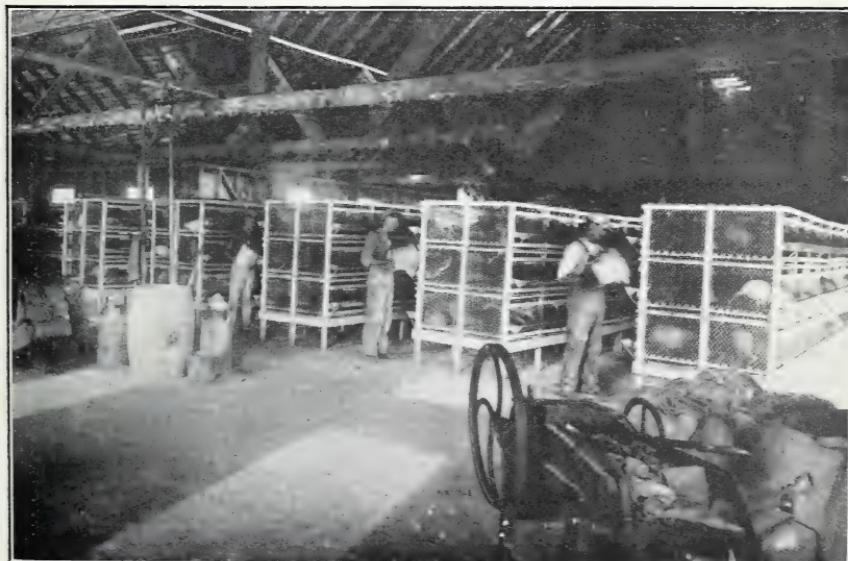


FIG. 2.—POURING THE FEED INTO THE TROUGHs.

THE EFFECT OF BUTTERMILK ON MOLTING.

The marked growth of feathers which occurs during a few days of fattening indicates that buttermilk and forced feeding tend to renew feathers rapidly. Chickens which do well in fattening are almost invariably covered with pin feathers, and this is an indication of good results in the feeder. Apparently a large amount of buttermilk in the feed greatly stimulates the growth of feathers, which fact might be noted in connection with the feeding of laying hens during the late summer to promote rapid molting and the growth of new feathers without forcing the birds.

THE BLEACHING EFFECT OF CONDENSED BUTTERMILK.

The No. 1 grade of poultry ordinarily sells for 1 to 2 cents more per pound than the third grade, so that a feeding mixture which will produce a greater per cent of the No. 1 grade has a commercial value. Buttermilk in the feed produces a bleach. An experiment was conducted at Station 4 to see whether the addition of condensed to ordinary buttermilk was profitable. One gallon of condensed buttermilk was added to 10 gallons of ordinary buttermilk from August 24 to September 18, and this test was repeated from October 4 to the 18th. The birds, as shown by Table III of the appendix, did not do well during the hot weather, which occurred about the middle of August. This is also shown in the grading reports. Condensed buttermilk was fed at this time and resulted in an immediate marked increase in the fancy grades of dressed poultry. This increase was greater than the relative increase in per cent of gain, showing that the increased consumption of buttermilk produced a larger per cent of fancy poultry, but when this condensed buttermilk was dropped out of the ration on September 18, the proportion of fancy poultry did not decrease. This would appear to show that the addition of extra condensed buttermilk was profitable only during warm or hot weather, and in fattening small birds. Condensed buttermilk was used entirely in mixing the feed at Stations 2 and 3, adding $1\frac{1}{2}$ gallons of water to 1 gallon of the milk at Station 2 and equal parts of water and condensed buttermilk at Station 3. This large proportion of milk solids showed very marked results in producing a bleach in the poultry.

MISCELLANEOUS RATIONS.

A test in cramming chickens, conducted by the feeder at Station 1, on ground Georgia peanuts with buttermilk, produced unfavorable results. The feed was very laxative, and the chickens, though eating well, grew thin instead of fat. A ration containing about 6 per cent of peanut meal gave good results. The peanuts flavored the flesh and produced a peanut-fed chicken which sold at a special price, but the unfavorable effects of feeding a large per cent of peanut meal made this ration impractical.

A ration consisting of 60 per cent steel-cut oats, 40 per cent corn meal, with three-fourths of a pound of tallow and half a pound of fresh meat per 100 head daily, mixed with buttermilk, gave very good results, producing extremely fat chickens. The oats were soaked in buttermilk a couple of hours before feeding.

A test was made of cooked meal obtained by adding boiling water to corn meal and allowing this mixture to stand for 12 hours. Some condimental foods were added to this feed, and milk was kept before the birds during the day, but the results were not particularly satisfactory.

Another test was made with low-grade flour in place of the steel-cut oats, and this produced almost as high gains at \$2 less cost per 100 head on feed. Table or cottonseed oil which cost 45 to 55 cents per gallon was tried in place of tallow. Chopped green alfalfa was added to the ration, but alfalfa has a tendency to color the flesh if fed up to killing time. None of these extra feeds appear to be either necessary or economical.

THE FEED AS AFFECTED BY CHANGES IN THE WEATHER.

The milk was heated before mixing with the feed at the different stations as soon as the weather turned cold in the fall. The consistency of the feed depends greatly on the weather. During hot weather the mixture should be made so that it will run rather than drip. In cooler weather it can be mixed with less milk to good advantage, but should drip freely. When thick condensed buttermilk is used, the feed can be mixed to a thicker consistency than with ordinary buttermilk. The monthly average of the per cent of buttermilk to total feed at Station 1 (Experiment B) was as follows: July, 67 per cent; August, 70 per cent; September, 68 per cent; October, 65 per cent, and November, 66 per cent. The daily variation in the per cent of milk was quite marked, especially in July and August.

NUMBER OF BIRDS IN EACH COMPARTMENT.

From 8 to 12 birds were placed in each compartment of the portable batteries at Stations 2, 3, and 4. Twelve birds were too many, as the birds scratched each others' backs through attempting to feed at the same opening. Ten birds gave good satisfaction at all of the stations, but 8 birds seemed to do better at Station 4 during hot weather. Ten birds in a compartment allows nine-tenths of a foot of floor space per bird in the battery. Later in the season, when the birds were larger, only 8 birds were placed in each compartment. Batteries of the size mentioned (2 feet 4 inches wide by 3 feet 10 inches long) will hold 80 broilers or medium-sized springs or 64 large springs or roasters without crowding, but in very hot weather it may pay to place only 64 head in each battery, if enough floor space is available.

REMOVING BIRDS "OFF FEED."

"Cripples" were removed from the batteries at Station 1 after October 26, which materially lowered the loss due to dead birds, but increased the cost of labor. These birds, if in good flesh, were dressed and their weight credited to their respective lots. The economy of this extra labor depends upon numerous conditions which are closely related. One reason for doing this at Station 1 and not at the other stations was that the birds were fed there for a longer time much later in the season than at the other stations. The conditions in the feeding station appeared to produce more sickly birds at Station 1 than at the others. If the chickens are carefully selected before they are put into the feeding station, so that no birds with colds or apparently out of condition go into the feeder, and they are only fed for a short period of 6 to 10 days under proper conditions of ventilation, it does not appear profitable to employ an extra man to remove "cripples." The regular help, however, must watch the birds carefully enough to prevent rousy conditions from spreading through the coops, although this is not likely to occur during the short feeding periods. Portable batteries placed a few inches apart keep the birds scattered so that any contagious disease will not spread as rapidly as in stationary coops or batteries.

FEATHER PICKING.

Two per cent of linseed meal was fed with the ration in Experiment D from September 1 to November 5. The linseed meal did not appear to affect the results of fattening in any way. The chickens during this period dressed particularly well, and it is possible that this linseed meal made picking easier, but its use would not be profitable for this purpose. The object of feeding linseed meal was to see if it had any effect on the habit of chickens picking each other. This vice caused considerable loss in fattening at times, but appeared to depend greatly on the condition of the chickens before they reached the packing house. Chickens which have not been well fed, or have been held for some time by the country merchant under poor conditions, are particularly subject to this vice, while in sections where the birds receive better care and are moved more quickly from the farm to the packing house, this habit does not cause any particular loss. Linseed meal added to the ration at Station 4 seemed to stop this vice, but the habit was not so widespread that a good test could be made. Either fresh meat or good beef scrap might prove of value where there was much loss due to this habit, but the remedy appears to lie largely in the use of better methods of handling the chickens before they reach the fattening stations.

Feather picking was more prevalent at all of the feeding stations in 1912 than it has ever been before. From 2 to 3 per cent of waste

meat and bones from local butcher shops was fed at Stations 2, 3, and 4 at irregular intervals during the season, but no consistent effect was noticed from this special feeding. Several lots at Station 3 were fed specially prepared mixed feeds which were claimed to prevent feather picking, but the results were inconsistent. The feather picking broke out during a period of cool weather, while the birds were eating ravenously, but stopped quite suddenly when the weather became warm and the birds were not so eager for their food. There appeared to be less loss due to this trouble where the largest per cent of buttermilk was fed in the ration, but feather picking can not be entirely controlled by regulating the proportion of buttermilk in the feed. Less heating rations, or those containing a large per cent of shorts and mixed feed and a small per cent of corn meal, make the best feeds for use in hot weather where feather picking is prevalent. The mixed feeds, however, produced chickens covered with small pin feathers, which resulted in a poorer grade of dressed product, and therefore made the feeding of the mixed feeds unprofitable as well as undesirable.

FATTENING HENS.

The results of fattening over 20,000 hens are shown in Tables 10 and 11, the feeding having been done at Stations 1, 2, and 4. All the lots were fed during November, 1911, and November and December, 1912.

The hens at Station 1 were fed coarse corn chop, or cracked corn with the meal left in, and 15 per cent of shorts, mixed with buttermilk. The shorts were added to facilitate mixing the feed, otherwise the corn chop would sink to the bottom of the mixer. The feed was mixed with considerable buttermilk and fed in a wet state.

The regular chicken mixture was fed to the hens at Stations 2 and 4, which, while producing slightly smaller gains, was apparently more efficient, as the average gain was produced with a pound less grain than with the corn chop, shorts, and buttermilk in 1911. It should be stated, however, that the increased cost of gain at Station 1 was due partly to the increased cost of buttermilk at this station, as the cost of grain in the rations was about the same, the regular chicken rations being slightly cheaper than the corn-chop ration. The comparative difference in cost of labor is due to the condition explained under Experiment B. A comparison of the results in 1912 does not show any marked advantage of one ration over the other.

TABLE 10.—*Experiments in fattening hens, 1911.*

STATION 1.

Lot.	Number in. <i>Head.</i>	Total weight lb. <i>Pounds.</i>	Average weight lb. <i>Pounds.</i>	Days fed.	Total feed. <i>Pounds.</i>	Total weight out. <i>Pounds.</i>	Total gain. <i>Pounds.</i>	Per cent gain. <i>Percent.</i>	Grain per 100 head. <i>Pounds.</i>	Grain per pound of gain. <i>Pounds.</i>	Total cost of feed per pound of gain. <i>Cents.</i>	Cost of labor per pound of gain. <i>Cents.</i>	Total cost per pound of gain. <i>Cents.</i>
1.....	348	1,081	3.1	9	1,290	800	1,441	122	9.2	19.3	6.00	1.67	7.67
2.....	392	1,319	3.4	9	1,500	800	1,902	433	12.5	31	6.56	2.87	13.28
3.....	1,170	3,469	3.0	9	3,902	1,390	1,525	11.4	14.7	37	5.77	2.72	11.67
4.....	392	1,338	3.4	10	900	1,425	1,833	14.7	47	4.92	8.95	2.58	12.07
5.....	392	1,242	3.2	10	900	1,225	1,830	13.2	43	4.71	9.49	2.14	9.85
6.....	784	2,536	3.2	10	2,000	2,370	3,304	15.8	52	5.39	9.28	2.34	11.62
7.....	392	1,288	3.3	12	1,100	1,492	2,004	15.8	52	5.36	8.36	1.92	10.28
Average.....			3.17					13.4		5.61	8.77	2.41	11.18

STATION 4.

1.....	378	1,284	3.4	7	438	1,422	1,38	10.7	37	3.17	5.07	1.31	6.38
2.....	330	1,152	3.5	8	439	1,275	1,23	10.7	37	3.57	5.66	1.42	7.08
3.....	384	1,320	3.4	8	526	1,465	145	11.5	38	3.63	5.74	1.83	7.57
4.....	236	867	3.4	8	343	934	67	7.7	26	5.12	8.18	2.87	11.05
5.....	448	1,477	3.3	9	672	1,646	169	11.4	38	3.98	6.31	1.54	7.85
6.....	320	1,084	3.4	9	483	1,198	114	10.5	36	4.24	6.83	1.91	8.74*
7.....	192	781	4.1	9	330	823	42	5.4	22	7.86	12.29	2.79	15.08
8.....	128	480	3.8	10	247	540	60	12.5	47	4.12	6.45	1.50	7.95
9.....	236	928	3.6	10	428	1,620	92	9.9	36	4.65	7.49	2.12	9.61
10.....	261	978	3.8	10	485	1,128	150	15.3	58	3.23	5.05	1.03	6.08
Average.....			3.51					10.6		4.16	6.61	1.77	8.38

TABLE 11.—*Experiments in fattening hens, 1912.*

STATION 1.

Lod.	Number of head,	Total weight,	Average weight in,	Dates fed.	Days fed.	Total feed.	Total weight out.	Pounds.	Pounds.	Percent gain.	Gain per 100 head.	Dead.	Grain per pound of gain.	Cost of feed per pound of gain.	Total cost per pound of gain.
1.....	450	Pounds.	Pounds.	1912.	Nov. 21 to Nov. 27.	7	554	1,581	154	11	34	10	6.15	Cents.	8.27
2.....	450	1,427	3.17	Nov. 22 to Nov. 28.	7	538	1,566	100	7	22	15	5.38	3.11	9.51	
3.....	450	1,466	3.26	Nov. 24 to Dec. 1.	8	475	1,571	111	8	25	13	4.28	2.19	9.51	
4.....	450	1,460	3.23	do.	8	474	1,593	139	10	31	7	3.41	1.73	7.56	
5.....	450	1,454	3.23	Nov. 27 to Dec. 3.	7	574	1,569	162	12	36	25	3.54	1.90	7.96	
6.....	450	1,407	3.18	Nov. 29 to Dec. 5.	7	627	1,569	69	5	15	15	9.09	1.54	4.67	
7.....	450	1,500	3.33	Dec. 5 to Dec. 11.	7	529	1,565	122	8	27	11	3.34	7.41	3.28	
8.....	450	1,443	3.21	Dec. 6 to Dec. 12.	7	529	1,529	139	10	31	13	3.81	6.50	3.41	
9.....	450	1,390	3.09	Dec. 6 to Dec. 12.	7	611	1,562	196	14	44	9	3.12	5.33	2.14	
Average.....	450	1,366	3.04	Dec. 10 to Dec. 16.	7	4.59	7.70	2.73	10.43
			3.19												

STATION 2.

1.....	1,500	5,871	3.91	Nov. 10 to Nov. 18.	9	3,030	6,387	516	9	34	31	5.87	10.67	Cents.	13.02
2.....	1,080	3,990	3.69	Nov. 12 to Nov. 18.	7	1,685	4,400	410	10	38	17	4.11	7.30	1.71	9.01
3.....	360	1,324	3.68	Nov. 13 to Nov. 19.	7	551	1,511	187	14	52	2	2.95	5.08	1.12	6.20
4.....	780	2,915	3.74	Nov. 14 to Nov. 20.	7	1,154	3,148	233	8	30	14	4.95	8.40	1.74	10.14
5.....	960	3,655	3.81	Nov. 15 to Nov. 21.	7	1,344	4,002	347	10	36	7	3.87	6.45	1.30	7.75
6.....	1,020	3,910	3.83	Nov. 16 to Nov. 22.	7	1,498	4,199	289	7	28	10	4.94	8.08	1.45	9.53
7.....	1,140	4,695	4.12	Nov. 17 to Nov. 24.	8	1,813	5,070	375	8	33	5	4.83	7.69	1.22	8.91
8.....	1,040	3,937	3.79	Nov. 19 to Nov. 26.	8	1,550	4,259	322	8	31	13	4.81	8.46	1.20	9.66
9.....	1,020	3,847	3.77	Nov. 21 to Nov. 28.	8	1,714	4,084	237	6	23	19	7.23	10.89	1.68	12.57
10.....	780	2,909	3.73	Nov. 20 to Nov. 28.	9	1,482	3,044	135	5	17	12	10.98	16.99	2.54	19.53
			3.83									5.51	9.16	1.67	10.83

Corn chop and buttermilk were fed to hens held for live shipment during the summer months, but in very hot weather the birds did better on a ration of corn chop with 8 per cent of low-grade flour and 5 per cent shorts, which was less heating than the corn chop alone. These lots were only held for a short time in hot weather, and the object of feeding was to prevent shrinkage rather than to produce gains. Some lots showed a slight gain, others held their own weight, while a few showed a small shrinkage.

Corn chop is difficult to feed, as it can not be mixed with milk and poured from a feeding pail, so that the labor of feeding this ration is greater than with the other ration. The corn chop not mixed with other grains is fed by taking up a scoopful of grain and milk together, and stirring the mixture frequently to prevent the corn from settling in the mixing tank or feeding pail. If tallow is used in the chicken mixture, the corn-chop ration might prove as economical as the other ration. The regular chicken mixture prevents shrinkage better in hot weather, is cheaper, requires less labor, and produces slightly more economical gains in feeding hens than the corn-chop ration.

LESS PROFIT IN FATTENING HENS THAN IN FATTENING CHICKENS.

The average cost of the hens into the feeder was 7.7 cents a pound in 1911 and 10.3 cents in 1912, so that a pound of flesh can be bought more cheaply than produced in the feeding station. Therefore it only pays to feed hens under certain conditions. The object in feeding hens at Station 1 was to supply a trade for "milk-fed" hens and to dispose of the light hens, which are somewhat of a drug on the market in the ordinary grades of dressed fowl. At Stations 2 and 4 the light hens and those which were covered with small pin feathers were selected for fattening. The latter kind would grow feathers rapidly, so that they would dress as fancy poultry after a week or ten days fattening.

A comparison of the results secured in fattening hens at these three stations is shown in Tables 10 and 11. The feeding was done in November and December. The average cost of fattening the hens in 1911 was 10.92 and 8.74 cents per pound of gain at Stations 1 and 4, respectively, and 10.43 and 10.83 at Stations 1 and 2, in 1912. This is lower than the corresponding cost of fattening chickens at these stations during the same months, but higher than the average cost of fattening for the season. However, it may be stated that the cost for fattening chickens at Station 4 during the greater part of November (see Table III, appendix) was abnormally high. In general the difference in the cost, if any, would be more than made up in the selling price. Therefore, as hens are bought and sold at a considerably lower price per pound, it is, as a rule, much more profitable to fatten chickens than to fatten hens.

INDIVIDUAL VARIATION IN FATTENING CHICKENS.

A study of Table 12 and of the variation in the summaries of the feeding experiments at the different stations shows that many factors affect the gains in fattening. Variation within a lot is due somewhat to the difference in the weight of the birds, but largely to the difference in the ability of the individuals to take on flesh under the existing conditions. This plainly shows how much variation exists in this ability to fatten readily, and the influence which the weather has in fattening. The possible error of conclusions drawn from small lots in fattening experiments is readily noted, and this possibility undoubtedly occurs under other poultry methods, as in the influence of feed and housing on the production of eggs. The marked effects of weather on fattening demonstrates the error which may occur in direct comparison of fattening tests conducted at different periods of the year, or in different seasons.

TABLE 12.—*Individual variation in fattening chickens.*

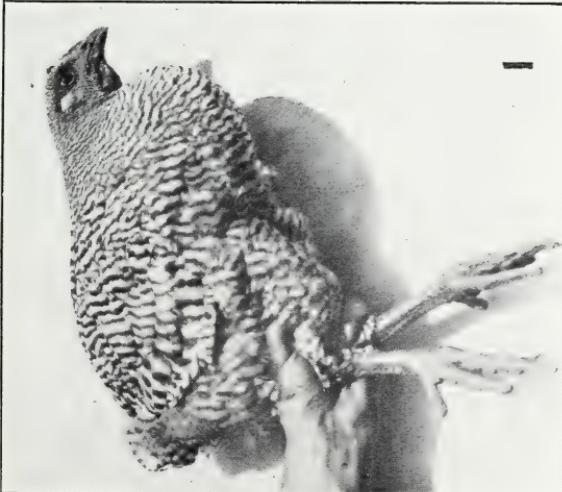
Number of head.	Kind.	Average weight.		Num- ber of days fed.	Per cent gain.		
		High.	Low.		High.	Low.	Average.
1,790	Roasters..	Pounds. 4.19	Pounds. 2.58	8	Per ct. 36.4	Per ct. 4.5	Per ct. 13
1,400	...do....	3.07	2.53	8	25.9	7.6	14
1,216	...do....	3.05	2.70	8	27.0	9.0	14
1,880	Springs....	2.03	1.43	15	55.0	17.0	27
1,080	...do....	1.95	1.62	14	63.0	18.0	29
768	Broilers..	1.89	1.69	14	56.0	12.0	36
320	...do....	1.75	1.23	14	45.0	36.0	39
600	...do....	1.65	1.50	14	53.0	18.0	38
480	...do....	1.76	1.40	14	39.0	31.0	35
320	...do....	1.75	1.61	14	43.0	25.0	41
1,024	Springs....	3.55	2.72	11	29.0	7.0	18
512	Broilers...	1.47	1.34	15	63.0	31.0	44
1,088	Springs....	2.28	1.11	13	67.0	11.0	35
768	...do....	1.58	1.47	14	45.0	30.0	37

In the above work individual records were kept of each battery containing 64 birds. The variation in average weight and in per cent of gains was between batteries of birds fed under the same conditions. The great variation in birds fattened under the same conditions suggests the economical possibility of rejecting certain birds in fattening. A very small per cent of birds called "rangers" were graded out of the receipts at Station 1 and killed without fattening. These birds consisted of black and feather legged stock, Leghorns, and birds out of condition. All black and feather legged birds were kept separate at Station 4 and fed only for a short period during the early part of the feeding season. Much better results could be secured in the fattening stations if only the best birds were selected for fattening, although this would require extra skilled labor for selecting, and involve a different and more complicated system of handling the birds at the packing house.

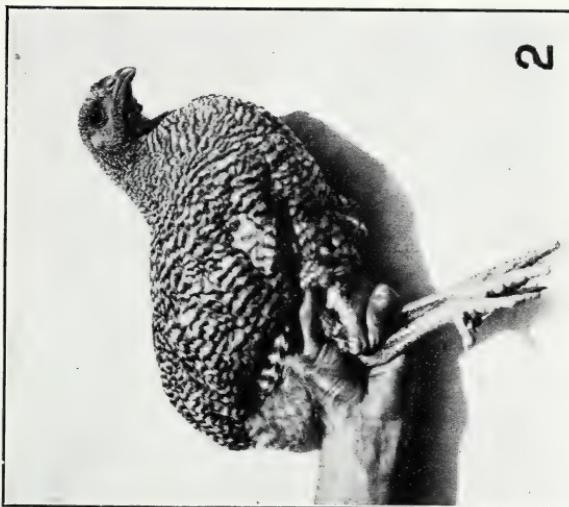
Fig. 1.—A very good feeder. Note the short, thick head. Fig. 2.—A poorer type of feeder. Note crow-like shape of head. Fig. 3.—A "enipple," or bird "off feed."

TYPES OF FEEDERS.

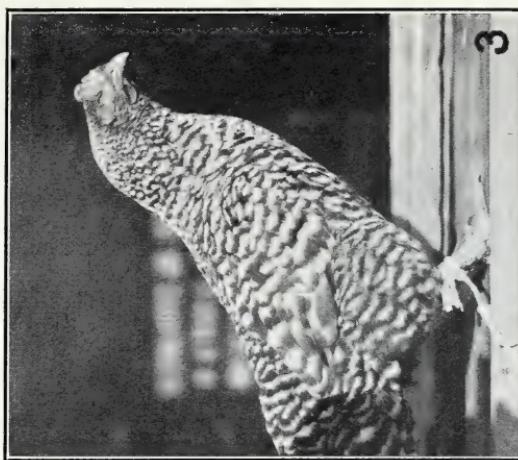
1



2



3



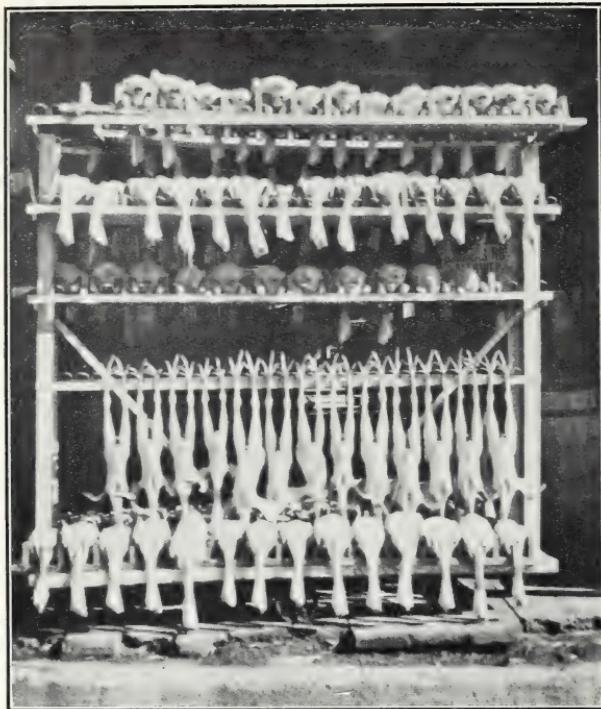


FIG. 1.—RACK FOR SQUATTED AND HANGING DRESSED POULTRY.



FIG. 2.—SPRAYING MACHINE, A LABOR-SAVING DEVICE.

MIXING MACHINES AND OTHER LABOR-SAVING DEVICES.

The horizontal mixing machine described in Bureau of Animal Industry Bulletin 140 was improved by adding one-third more blades. After this change had been made the feed was mixed more quickly, and the operator could put the dry grain directly into the feeder without previous mixing. Another mixer installed at Station 3 was made on the same plan as the previous machine, except that the blades were arranged as a spiral on the shaft so that in mixing the feed worked toward the center from either end. A mixing machine is a good investment when one is fattening a large number of chickens. The use of labor-saving mechanical devices in fattening stations has enabled one man to care for 4,000 to 5,000 birds. Results secured at these stations show that mechanical features can be used to good advantage in handling poultry commercially, provided the stations are kept clean. Mechanical features, besides saving greatly in the amount of labor, make it possible to use unskilled help in a fattening station. Similar features might be used to good advantage in handling poultry under commercial conditions other than fattening.

ADVANTAGE OF THE PORTABLE FEEDING BATTERY.

On comparing the results in 1911 at Station 1 (Experiment B), where stationary batteries were used, with those secured at the other stations, we find that the average pound of gain was produced with the smallest amount of feed (3.33 pounds) in this experiment, while the lowest cost of gain was made in Experiment C, due largely to the differences in the price of milk. The cost of labor (per pound gain) in Experiment B averaged considerably higher than at any other station. This increased cost was due to the method of handling the chickens, as the stationary feeding battery involves more handling of the birds than the portable feeding battery (described in Bulletin 140); also to the fact that the manager of this feeding station was a higher paid man than the other managers, and to the cost of an extra man employed to go through the batteries daily, or every day during the poor feeding season in October, November, and December, to remove all the birds "off feed" or sickly. The portable feeding battery unquestionably saves labor and eliminates some of the bruising of the birds caused by rehandling where stationary batteries are used.

EXPERT LABOR.

An expert manager, who is paid higher wages than the regular labor about a feeding station, is a necessity in the average feeding station, unless the manager of the packing house understands how to fatten chickens and watches the work closely enough so that he

can successfully direct ordinary help which shows some adaptability in feeding chickens and has had some experience in that work. Under ordinary conditions such help, if well selected and properly advised, may secure very good results; but in case of emergency, such as an over-supply of chickens, or extremely hot or cold weather, the expert manager easily proves his extra worth, as it is impossible for the manager of the average poultry house to always be on hand during such occasions. Conclusions drawn from the season's work show that in these cases the cost of the expert labor, combined with the different methods of handling the birds and the extra labor of picking out sick birds and "cripples," made the labor cost per pound of gain considerably higher than at any of the other stations, the average cost of labor per 100 pounds of gain at the stations being \$1.41 at Station 3, \$1.58 at Station 2, \$1.75 at Station 4, and \$2 at Station 1.

GRADING POULTRY.

Two grades of dressed poultry were made at Station 1—fancy, or No. 1, and choice, or No. 2—with a very small per cent of culls which are not included in these tables. The variation at this station for each successive 20 lots was as follows, the figures given representing the No. 2 grade: 7.9 per cent, 13.5 per cent, 13.4 per cent, 14.8 per cent, 14.7 per cent, 12.8 per cent.

Four grades were made at Station 4, classed as Nos. 1, 2, 3, and 4. The No. 1 grade included all fancy dressed poultry which plainly showed the effect of milk feeding, particularly a bleach, which is so characteristic of milk-fed poultry. The second grade was made up of well-bleached poultry, not as well fleshed as the first grade or which had undesirable market features, such as black or feathered legs, dark pin feathers, or not neatly dressed. The third grade included the well-fleshed birds, which were not well bleached, while the fourth grade bore the same relation to the third as the second did the first. The per cent of the several grades was as follows for each successive two weeks during the season: No. 1, 39, 25, 21, 35, 39, 45, and 24; No. 2, 9, 6, 5, 8, 10, 10, and 8; No. 3, 35, 44, 49, 35, 34, 38, and 13; and No. 4, 17, 25, 25, 22, 17, 7, and 55. The per cent of fancy grades varied directly with the per cent of gains in the feeding station, high gains producing a large per cent of the No. 1 grade.

SHRINKAGE IN DRESSING.

The shrinkage in killing and picking without drawing at Station 1 averaged 11.4 per cent for lots 1 to 20; 13.5 per cent for lots 21 to 40; 13.4 per cent for lots 41 to 60; 14.3 per cent for lots 61 to 80; 15.4 per cent for lots 81 to 100; and 15.1 per cent for lots 101 to 113. The lowest shrinkage was in the broilers, and gradually increased with

the size of the chickens as the feeding season advanced. Batteries weighed when received at the poultry house and reweighed the following morning before the birds were fed, gave an average shrink of 2 per cent. The shrinkage in killing and picking without drawing at this station in 1912 averaged 11.3 per cent for lots 1 to 20; 12.4 per cent for lots 21 to 40; 13.4 per cent for lots 41 to 60; 14.1 per cent for lots 61 to 80; and 14.6 per cent for lots 81 to 100. The shrinkage on hens was 12.9 per cent.

INITIAL COST OF CHICKENS AS AFFECTING PROFIT IN FATTENING.

The average cost per pound of the birds into the feeder in Experiment B in 1911 was as follows: Lots 1 to 12, 17.6 cents; lots 13 to 19, 15 cents; lots 20 to 30, 13 cents; lots 31 to 49, 12 cents; lots 50 to 63, 11 cents; lots 64 to 80, 10 cents; lots 81 to 108, 9 cents; and lots 109 to 118, 9.3 cents. The cost of picking, grading, and packing (including freezing) was about 7 cents per head. The gradual decrease of the average cost into the feeder is the reason for feeding longer early in the season, especially as the cheapest gains are made on these first lots; while later the flesh can be bought more cheaply than produced in fattening. For example, an average lot early in the season cost 17.6 cents per pound into the feeder, and the gain in fattening cost 7 cents per pound; an average lot late in the fall costs 9 cents per pound into the feeder, while the gain costs 10.5 cents per pound. The total cost per pound when dressed and packed for this first lot was 20.5 cents; for the other, 13.1 cents; but the first brought a much higher price in the market than the second. These costs were the average extremes of high and low cost, the total dressed costs gradually dropping as the season advanced. The average cost per pound of the birds into the feeding station in Experiment B in 1912 was as follows: Lots 1 to 21, 18 cents; lots 22 to 42, 16 cents; lots 43 to 57, 14.2 cents; lots 58 to 75, 11 cents; lots 76 to 100, 11.2 cents. Average cost per pound for the season 14.05 cents, as compared with 11.5 cents in 1911.

RELATION OF GRAIN FED TO MANURE PRODUCED.

Table 13 shows the average grain consumed and amount of manure produced daily per 100 head of chickens in fattening. This is a record of 900 head of birds at Station 1, Experiment B, kept from July 18 to November 16, 1911. These birds were fed a ration of 1 part shorts, 2 parts low-grade wheat flour, and 3 parts corn meal, by weight, with 6 per cent of tallow, mixed with ordinary buttermilk.

TABLE 13.—*Estimated production of poultry droppings and consumption of feed per 100 head.*

Dates.	Average grain daily per 100 head.	Average manure wet/daily per 100 head.	Percent of manure to grain.
	Pounds.	Pounds.	Per cent.
July 18-31.	12.5	12	96.0
Aug. 1-16.	10.9	11	100.9
Aug. 17-31.	14.3	11	76.9
Sept. 1-16.	13.1	12	91.6
Sept. 17-30.	15.4	19	123.4
Oct. 1-16.	16.7	20	119.8
Oct. 17-30.	16.2	17	104.9
Nov. 1-16.	14.5	16	110.3
Average.	14.2	14.7	103.5

The figures in the table vary considerably, although it may be stated that the amount of buttermilk in the feed affects the comparisons by increasing the amount of moisture in the droppings, especially during hot weather. The manure when weighed was soft and wet, so that the dry weight would be very much smaller. The birds eat more feed as they increase in size, especially during cool weather.

DIGESTIBLE PROTEIN AND ENERGY VALUES OF THE RATIONS.

The protein and the energy values of the various rations used in these fattening experiments show clearly the effect of thick condensed buttermilk, tallow, and oat flour in fattening. The following prices of grain and milk per 100 pounds were used: Corn meal, \$1.35; low-grade wheat flour, \$1.35; wheat shorts, \$1.28; oat flour, \$2.25; condensed buttermilk, \$1; and ordinary buttermilk, \$0.25. Farmers' Bulletin 346, United States Department of Agriculture, entitled "The Computation of Rations for Farm Animals by the Use of Energy Values," was used in deriving the protein and energy values of these feeds. Sixty per cent of the total feed was estimated as buttermilk in figuring the effect of the buttermilk on the energy value of the feed.

TABLE 14.—*Digestible protein and energy value per 100 pounds of rations used.*

Ration No.	Composition of rations (parts by weight).	Digestible protein.	Energy value.	Cost.
		Pounds.	Therm.	
1	3 parts corn meal, 2 parts low-grade wheat flour.	8.31	86.41	\$1.35
2	3 parts corn meal, 2 parts oat flour (buils out).	8.36	87.08	1.71
3	3 parts corn meal, 2 parts low-grade wheat flour, 1 part shorts.	9.06	84.95	1.34
4	4 parts corn meal, 2 parts low-grade wheat flour, 1 part shorts.	8.74	85.50	1.34
5	2 parts corn meal, 1 part oat flour (buils out), 1 part low-grade wheat flour.	8.72	86.22	1.58
	100 pounds ration No. 1, with condensed buttermilk and diluted 1½ parts with water.	19.71	117.33	1.95
	100 pounds ration No. 2, with ordinary buttermilk and 6 per cent tallow.	14.26	114.50	2.40
	100 pounds ration No. 3, with ordinary buttermilk.	14.76	100.41	1.71

Rations Nos. 1, 3, and 4 have a feeding value about equal to ration No. 2 at 36 and 37 cents less per 100 pounds, due largely to the price of oat flour. Ration No. 1 fed with condensed buttermilk diluted with one and one-half parts of water has a much higher feeding value than any of the other rations fed with ordinary buttermilk, at a slightly lower cost than ration No. 2. Rations Nos. 1 and 3 as fed proved in feeding to be the most economical rations, while ration No. 4 gave very good results in cool weather, late in the feeding season.

TABLE 15.—*Comparison of the different rations on the basis of the cost per pound of gain.*

Ration No.	Gain.	Grain.		Buttermilk.		Total cost.
		Amount.	Cost.	Amount.	Cost.	
1	Pound.	Pounds.		Pounds.		
1	1	3.63	\$0.049	12.72	\$0.0272	\$0.0762
2	1	3.33	.0676	4.99	.0125	.0801
3	1	4.17	.0559	6.27	.0157	.0716
1a	1	4.20	.0567	12.52	.0252	.0819

¹ Condensed.

Ration No. 1 was fed with condensed buttermilk diluted with 1 part of water, Nos. 2 and 3 were mixed with ordinary buttermilk, and No. 1a is ration No. 1 fed with condensed buttermilk diluted with one and one-half parts of water. Ration No. 2 was fed with 6 per cent of tallow. These costs are figured on a uniform price of milk and grains at all of the stations, while the costs of gains in each experiment is the actual cost at each feeding station, where the price of buttermilk and grain varied. The amount and cost of the grain and buttermilk per pound of gain at each of the feeding stations is given in Table 16.

COMPARISON OF EXPERIMENTS OF 1910, 1911, AND 1912.

Table 16 gives the average results of the feeding experiments covering three years at the four feeding stations, during which time 1,196,646 birds were fed. The lots in Experiment A were fed longer in 1911 than in 1910, which explains the increased cost of the gains during 1911. The ration in Experiment B was cheaper in 1911 than in 1910; the feeding station was run at full capacity during 1911, which reduced the labor cost compared with 1910, when the station was not full. The milk used in Experiment C was much cheaper than that in Experiment B, which lowered the cost of gains in Experiment C. The price of the grains was higher in 1912 than in 1911, especially in Experiments C and D, which increased the cost of gain. Feather picking resulted in much loss of gain in Experiments A, C, and D. The results secured in Experiment C were better, while those in Experiments A and D were not as good as those produced in 1911.

TABLE 16.—Comparative data of feeding experiments of 1910, 1911, and 1912.

Experiment.	Year.	Number of head.	Average weight.	Average per cent of gain.	Average grain per pound of gain.	Average cost of feed per pound of gain.	Average cost of labor per pound of gain.	Average total cost per pound of gain.
A	1910	43,944	Pounds. 2.42	Per cent. 18.1	Pounds. 3.26	Cents. 6.45	Cents. 1.40	Cents. 7.85
	1911	60,144	2.47	18.6	3.62	7.83	1.35	9.18
	1912	90,069	2.44	18.6	4.42	8.74	1.63	10.37
B	1910	61,706	2.82	18.7	3.26	7.74	2.59	10.33
	1911	102,684	2.56	26.0	3.33	7.20	2.90	9.20
	1912	90,000	2.36	26.7	3.58	7.70	1.99	9.69
C	1910	113,217	.....	20.2	.....	.....	.....	.....
	1911	117,151	2.48	20.4	4.45	7.15	1.81	8.96
	1912	211,560	2.21	20.7	3.72	6.61	1.37	7.98
D	1910	89,319	.....	20.1	.....	.....	.....	.....
	1911	109,800	2.68	18.0	4.18	8.71	1.56	10.27
	1912	107,052	2.69	15.7	4.98	9.95	1.59	11.54

CONCLUSIONS.

The average cost and the amount of feed consumed in fattening 394,744 chickens at the four feeding experiments in alphabetical order during the season of 1911 were, respectively, as follows: Grain per pound of gain, 3.62, 3.33, 4.45, and 4.18 pounds; cost of feed per pound of gain, 7.83, 7.20, 7.15, and 8.71 cents; total cost per pound of gain, 9.18, 9.20, 8.96, and 10.27 cents. The averages in 1912 for 498,681 chickens were: Grain per pound of gain, 4.42, 3.58, 3.72, and 4.98 pounds; cost of feed per pound of gain, 8.74, 7.70, 6.61, and 9.95 cents; total cost per pound of gain, 10.37, 9.69, 7.98, and 11.54 cents.

Tallow, while making the fat on the birds more pronounced, increased the cost of gains. Thick condensed buttermilk in place of tallow produced better results.

Oat flour produced greater gains than low-grade wheat flour, but the latter feed produced cheaper gains.

Beef scraps added to the buttermilk in a fattening ration did not increase the gain. The addition of condimental feeds did not increase the appetite of the birds or help the gains. Grit is of no value in fattening for any period under 15 days.

Under commercial conditions in the Middle West the best results are secured by fattening for about 14 days until the middle of September, and then gradually shortening the period to 6 or 7 days.

The birds ate more feed on three feeds a day but used feed more efficiently when fed only twice.

Mechanical labor-saving devices reduced the cost of fattening by reducing both the total amount of labor and the proportion of skilled labor required. The portable feeding battery turned out the birds in better condition and reduced the cost of labor per pound of gain.

Gains were produced at 1.89 and 1.41 cents, respectively, per pound cheaper in 1911, and 6.30 and 2.68 cents less in 1912 on broilers than on roasters, in two experiments.

There was great variation in the results secured in fattening. This was due to the difference in the ability of the birds to take on flesh, to their weight, and to the effect of weather conditions. The variation in birds makes their selection in fattening of considerable importance, if the labor of the extra work can be handled economically. The influence of the weather in fattening allows a chance of error in comparing fattening experiments conducted at different times.

The bleach produced by fattening with buttermilk varies according to the amount of milk solids consumed by the birds.

The average cost of fattening hens in November and December was 10.92 and 8.74 cents in 1911 and 10.83 and 10.43 cents in 1912, respectively, per pound of gain at two stations. This is higher than the average cost of fattening chickens for the entire season at the same stations but less than the cost of fattening chickens in November and December. Hens cost 7.7 cents per pound in 1911 and 10.3 cents in 1912, into the feeder, so that their flesh can be bought cheaper than produced at this time of the year. Cheaper gains were secured in fattening hens in 1911 on the rations used in fattening chickens than on a ration of corn chop with 15 per cent of shorts mixed with buttermilk.

Chickens cost 17.6 cents per pound into the feeder in July, 1911, while the gains cost 7 cents per pound at this time; in November, 1911, they cost 9 cents per pound into the feeder, and the gains cost 10.5 cents per pound. This influences the profit in fattening and the best length of time to fatten, making it advisable to feed longer in the first part of the season. The cost of picking, grading, and packing (including freezing) was about 7 cents per head, making the total average cost of a pound of dressed poultry in July, 20.5 cents, which gradually decreased through the season to 13.1 cents in November, 1911.

The best results were secured with the following three rations: No. 1, 3 parts of corn meal, 2 parts of low-grade wheat flour, and 1 part of shorts; No. 2, 3 parts of corn meal and 2 parts of low-grade wheat flour, and No. 3, 5 parts of corn meal, 3 parts of low-grade wheat flour, 1 part of shorts, and 5 per cent of tallow. The same feeding value is secured in a ration of 3 parts of corn meal and 2 parts of oat flour but at an increased cost of 37 cents per 100 pounds of gain. Four parts of corn meal, 2 of low-grade wheat flour, and 1 of shorts gave very good results during the latter part of the feeding season, or in cool weather; that is, the proportion of corn meal and low-grade wheat flour may be increased in cool weather.

APPENDIX.

Details of feeding experiments in 1911 and 1912.

GOVERNMENT AERONAUTIC STATION 3, 1911.

Class.	Number in.	Average weight in. lb.	Dates fed.	Total weight out. lb.	Days fed.	Total feed.	Pounds.	Pounds.	Pounds.	Pounds.	Pounds.	Head.	Dead.	Gain per 100 head.	Per cent gain.	Total feed per pound of gain.	Cost of labor per pound of gain.	Total cost per pound of gain.	
1	Broilers...	1,430	Pounds.	1,913	1.3	July 27 to July 31...	11	1,916	2,400	496	2,400	20	3.86	1.32	9.39	1.32	9.39	1.32	9.39
2	do	540	74	1,33	July 23 to July 31...	9	633	936	212	30	2,99	5	1.00	7.17	1.00	7.17	1.00	7.17	
3	do	2,80	2,142	2,142	1.7	July 26 to Aug. 3...	9	510	2,531	380	30	8	2.88	7.67	2.88	7.67	2.88	7.67	
4	do	640	1,146	1,146	1.7	July 27 to Aug. 4...	9	765	1,316	200	18	31	2	3.78	7.50	3.78	7.50	3.78	7.50
5	do	1,120	1,894	1,894	1.7	July 28 to Aug. 6...	10	4,456	2,392	498	26	45	5	2.92	5.80	1.22	5.80	1.22	5.80
6	Springers*	720	1,289	1,289	1.8	July 26 to Aug. 7...	10	929	1,533	244	19	34	6	3.81	7.67	1.65	7.67	1.65	7.67
7	do	960	1,660	1,660	1.7	July 30 to Aug. 7...	9	1,114	2,018	358	22	37	7	3.11	6.27	1.39	6.27	1.39	6.27
8	do	640	938	938	1.5	July 30 to Aug. 10...	11	832	1,174	216	23	34	9	3.85	8.15	2.01	8.15	2.01	8.15
9	Springers*	800	1,398	1,398	1.8	Aug. 2 to Aug. 10...	9	824	1,683	204	24	37	2	2.80	6.01	1.38	6.01	1.38	6.01
10	do	560	905	905	1.6	Aug. 3 to Aug. 11...	9	560	1,089	184	20	33	3	3.04	6.79	1.86	6.79	1.86	6.79
11	Springers*	720	1,364	1,364	1.9	Aug. 4 to Aug. 13...	10	792	1,504	140	10	19	11	5.66	13.01	3.65	13.01	3.65	13.01
12	do	640	1,104	1,104	1.9	Aug. 6 to Aug. 13...	8	550	1,373	179	15	25	4	3.67	7.15	2.01	7.15	2.01	7.15
13	do	630	1,137	1,137	1.8	Aug. 8 to Aug. 15...	8	543	1,322	185	16	29	2	2.94	7.15	2.18	7.15	2.18	7.15
14	do	656	1,054	1,054	1.9	Aug. 9 to Aug. 17...	9	523	1,203	162	14	27	9	3.44	8.63	2.00	8.63	2.00	8.63
15	do	480	954	954	2.0	Aug. 12 to Aug. 20...	9	499	1,142	188	20	39	2	2.65	6.61	1.76	6.61	1.76	6.61
16	do	800	1,522	1,522	1.9	Aug. 6 to Aug. 24...	9	960	1,920	398	26	50	5	2.41	5.93	1.27	5.93	1.27	5.93
17	do	640	1,268	1,268	2.0	Aug. 17 to Aug. 27...	11	1,005	1,616	318	27	54	3	2.89	6.91	1.41	6.91	1.41	6.91
18	do	560	1,656	1,656	1.9	Aug. 18 to Aug. 28...	11	924	1,402	346	33	53	1	2.67	6.35	1.29	6.35	1.29	6.35
19	do	400	835	835	2.1	Aug. 22 to Aug. 31...	10	604	1,055	200	50	33	3	3.32	7.40	1.62	7.40	1.62	7.40
20	do	560	1,110	1,110	2.0	Aug. 23 to Sept. 1...	10	924	1,407	297	53	4	3.11	6.92	1.47	6.92	1.47	6.92	
21	do	640	1,342	1,342	2.1	Aug. 26 to Sept. 4...	10	1,656	1,678	296	23	46	—	3.57	7.50	1.63	7.50	1.63	7.50
22	do	560	1,195	1,195	2.1	Aug. 27 to Sept. 5...	10	1,930	1,600	295	25	53	—	3.15	6.47	1.35	6.47	1.35	6.47
23	do	640	1,411	1,411	2.2	Aug. 31 to Sept. 12...	13	3,344	1,783	372	26	58	—	3.01	7.14	1.39	7.14	1.39	7.14
24	do	1,040	4,417	4,417	2.2	Sept. 1 to Sept. 13...	11	1,433	1,600	383	27	50	6	2.96	6.08	1.10	6.08	1.10	6.08
25	do	2,181	2,181	2,181	2.1	Sept. 6 to Sept. 15...	10	1,602	2,705	524	24	50	6	3.06	5.94	1.21	5.94	1.21	5.94
26	do	720	1,574	1,574	2.2	Sept. 7 to Sept. 16...	10	1,102	1,953	379	24	53	4	2.91	5.66	1.40	5.66	1.40	5.66
27	do	520	2,715	2,715	1.8	Sept. 8 to Sept. 18...	11	2,715	3,333	618	23	47	4	4.41	7.77	1.62	7.77	1.62	7.77
28	do	720	1,992	1,992	2.2	Sept. 9 to Sept. 18...	10	1,006	1,870	287	18	40	8	3.71	7.02	1.38	3.71	1.38	3.71
29	do	1,360	4,800	4,800	2.1	Sept. 10 to Sept. 19...	12	2,067	3,489	526	24	44	13	3.47	7.84	1.25	3.47	1.25	3.47
30	do	640	1,350	1,350	2.1	Sept. 11 to Sept. 24...	13	1,350	1,622	284	21	44	4	4.75	10.43	1.60	4.75	1.60	4.75

31	1,631	2.3	Sept. 13 to Sept. 24...	12	1,411	1,924	293	18	4.82	8.99
32	720	2.6	Sept. 15 to Sept. 26...	12	2,952	4,341	619	17	5.47	8.77
33	1,440	3.2	Sept. 16 to Sept. 26...	12	3,732	6,024	4,469	20	4.14	7.65
34	1,600	2.3	Sept. 16 to Sept. 26...	11	1,906	2,242	730	19	5.22	9.45
35	880	2.2	Sept. 17 to Sept. 28...	12	1,845	2,260	354	11	5.22	9.45
36	720	2.5	Sept. 20 to Sept. 28...	9	1,750	2,043	253	14	4.55	8.14
37	1,320	2.3	Sept. 22 to Sept. 28...	768	1,757	2,014	257	15	3.68	1.11
38	640	2.9	Sept. 23 to Oct. 1...	7	1,851	2,157	306	17	3.30	1.11
39	576	2.8	Sept. 24 to Oct. 1...	8	1,584	2,795	839	16	4.44	2
40	644	2.8	Sept. 28 to Oct. 3...	6	1,792	2,109	317	18	0	0
41	1,320	2.8	Oct. 1 to Oct. 10...	10	3,741	4,528	787	21	1.02	1.02
42	640	2.8	Oct. 3 to Oct. 10...	8	1,810	2,154	344	19	54	4
43	960	2.9	Oct. 4 to Oct. 11...	8	2,766	2,450	528	19	55	4
44	832	2.9	Oct. 6 to Oct. 12...	7	2,334	2,107	815	16	4.66	1
45	501	1.7	Oct. 12 to Oct. 15...	15	852	1,388	388	10	3.93	1.38
46	240	1.6	Oct. 5 to Oct. 18...	14	379	622	550	71	0	0
47	480	1.5	Oct. 6 to Oct. 22...	17	731	1,498	1,021	40	7	1.80
48	960	3.0	Oct. 7 to Oct. 13...	7	2,862	1,258	466	16	2.75	1.91
49	1,280	3.0	Oct. 8 to Oct. 17...	10	3,660	2,342	4,464	604	1.91	1.01
50	320	4.73	Oct. 8 to Oct. 23...	16	949	934	202	43	1.63	1.63
51	960	2.760	Oct. 11 to Oct. 19...	2.9	1,750	1,653	3,26	21	59	4
52	240	3.0	Oct. 12 to Oct. 20...	9	394	1,236	546	152	39	2
53	768	2,330	Oct. 13 to Oct. 20...	7	1,236	2,662	332	14	4.03	4
54	768	2,365	Oct. 13 to Oct. 20...	3.1	1,236	1,091	2,666	301	13	3.72
55	961	2,419	Oct. 14 to Oct. 22...	3.2	1,236	1,244	2,962	543	23	1.36
56	961	3,321	Oct. 15 to Oct. 23...	3.5	1,236	1,586	3,992	671	20	1.36
57	556	4,094	Oct. 11 to Oct. 24...	14	1,236	1,651	4,466	372	9	1.41
58	837	872	Oct. 12 to Oct. 20...	7	1,236	1,434	1,088	216	25	1.38
59	336	860	Oct. 13 to Oct. 25...	1.6	1,236	1,080	2,986	306	11	1.39
60	2,120	6,643	Oct. 20 to Oct. 26...	7	1,236	2,756	7,627	984	15	4.44
61	640	1,975	Oct. 21 to Oct. 29...	3.1	1,236	1,07	2,250	275	14	1.38
62	1,840	5,488	Oct. 22 to Oct. 29...	3.0	1,236	2,815	6,063	575	10	1.39
63	290	513	Oct. 22 to Nov. 6...	1.8	1,236	879	672	159	31	1.84
64	Roasters...	3.1	Oct. 24 to Oct. 30...	7	1,940	5,219	623	14	4.78	1.55
65	Roasters...	3.2	Oct. 25 to Oct. 31...	7	1,940	3,338	338	14	4.72	1.53
66	Roasters...	3.2	Oct. 26 to Nov. 1...	7	1,940	4,100	375	10	4.02	1.41
67	Roasters...	2,315	Oct. 28 to Nov. 2...	6	1,940	808	2,489	174	8	1.72
68	Roasters...	4,596	Oct. 24 to Oct. 30...	7	1,940	5,219	623	14	4.72	1.53
69	Roasters...	1,020	Oct. 25 to Oct. 31...	7	1,940	3,338	338	14	4.72	1.53
70	Roasters...	1,170	Oct. 26 to Nov. 1...	7	1,940	4,100	375	10	4.02	1.41
71	Roasters...	748	Oct. 28 to Nov. 2...	6	1,940	808	2,489	174	8	1.72
72	Roasters...	832	Oct. 29 to Nov. 6...	9	1,940	3,201	431	16	5.53	5
73	1,280	4,770	Oct. 30 to Nov. 6...	7	1,940	4,770	4,744	443	10	3.28
74	4,301	3,34	Nov. 1 to Nov. 7...	6	1,706	817	2,529	803	3	1.16
75	2,251	3,34	Nov. 4 to Nov. 9...	6	1,706	817	2,529	803	3	1.16
76	704	3,33	Nov. 5 to Nov. 11...	7	1,706	2,442	6,919	803	0	1.16

Details of feeding experiments in 1911 and 1912. Continued.

EXPERIMENT A, STATION 3, 1912.

Lod.	Class.	Number in.	Total weight in.	Average weight in.	Dates fed.	Days fed.	Total feed.	Total weight out.	Total gain.	Per cent. gain.	Gain per head.	Dead.	Dead.	Grain per bound of gain.	Total cost of feed per pound of gain.	Total cost per pound of gain.	
1	Broilers...	720	1,191	1.52	1912	Aug. 6 to Aug. 19...	14	1,339	1,600	409	34	57	3.27	6.50	1.09	7.69	
2	Springers...	560	1,014	1.81		Aug. 8 to Aug. 20...	13	1,963	1,230	216	21	39	4.46	8.84	1.53	10.37	
3	do.....	720	1,309	1.82	Aug. 9 to Aug. 21...	13	1,258	1,000	201	22	40	4.25	8.39	1.48	9.87		
4	Broilers...	720	1,261	1.75	Aug. 13 to Aug. 22...	10	960	1,619	368	28	50	2.65	5.09	1.03	6.12		
5	Springers...	1,120	2,032	1.81	Aug. 15 to Aug. 23...	9	1,366	2,344	312	15	28	4.38	8.22	1.65	9.87		
6	Broilers...	1,260	2,044	1.70	Aug. 17 to Aug. 25...	9	1,392	2,460	416	20	35	8	3.35	6.40	1.36	7.76	
7	Springers...	2,480	1,465	1.80	Aug. 18 to Aug. 26...	11	3,947	551	651	15	26	18	5.20	10.06	2.13	12.19	
8	Broilers...	720	1,180	1.65	Aug. 18 to Aug. 27...	10	874	1,438	249	21	35	7	3.50	6.77	1.47	8.24	
9	Springers...	1,040	1,849	1.78	Aug. 19 to Aug. 27...	9	1,123	2,202	353	19	34	13	3.18	6.25	1.39	7.64	
10	do.....	720	1,374	1.91	Aug. 20 to Aug. 28...	9	1,720	1,583	200	15	29	15	3.68	7.23	1.72	8.95	
11	Broilers...	1,520	2,440	1.61	Aug. 23 to Sept. 2...	11	2,098	2,869	420	18	28	11	4.80	9.35	2.30	11.65	
12	do.....	2,210	3,690	1.65	Aug. 23 to Sept. 3...	12	3,200	4,632	912	26	42	19	3.57	6.82	1.66	8.48	
13	do.....	1,440	2,446	1.70	Aug. 23 to Sept. 4...	13	3,318	3,145	699	29	49	18	3.32	6.39	1.59	7.98	
14	Springers...	1,360	2,417	1.73	Aug. 26 to Sept. 5...	11	1,899	3,031	614	25	45	10	2.95	5.76	1.48	7.24	
15	do.....	720	1,409	1.96	Aug. 28 to Sept. 8...	12	1,087	1,749	340	24	47	7	3.20	6.35	1.50	7.86	
16	do.....	1,040	1,825	1.76	Aug. 29 to Sept. 8...	11	1,446	2,258	423	41	41	2	3.42	6.84	1.57	8.38	
17	do.....	960	1,783	1.80	Aug. 31 to Sept. 10...	12	1,469	385	40	17	35	3	3.82	7.56	1.70	9.26	
18	do.....	800	1,556	2.07	Sept. 1 to Sept. 10...	11	1,104	1,938	282	17	36	8	3.50	7.80	1.76	9.56	
19	do.....	880	1,763	2.00	Sept. 3 to Sept. 12...	10	1,100	2,077	314	18	36	8	3.50	7.17	1.51	8.71	
20	do.....	1,600	2,028	1.89	Sept. 4 to Sept. 15...	12	2,128	3,307	769	25	48	12	6.72	1.48	8.20		
21	do.....	720	1,567	2.09	Sept. 5 to Sept. 17...	13	1,296	1,979	472	34	66	5	2.75	5.67	1.17	6.84	
22	do.....	720	1,569	2.22	Sept. 7 to Sept. 19...	13	1,396	2,047	448	28	62	7	3.08	6.32	1.27	7.50	
23	do.....	556	1,162	2.09	Sept. 6 to Sept. 19...	14	1,134	2,543	381	33	69	2	2.98	6.06	1.24	7.30	
24	do.....	800	1,639	2.05	Sept. 10 to Sept. 20...	11	1,360	2,112	473	29	30	1	5.85	1.15	7.00		
25	do.....	1,360	2,635	1.94	Sept. 11 to Sept. 22...	12	2,998	3,462	827	34	61	24	3.14	6.41	1.20	7.61	
26	do.....	1,120	2,275	2.03	Sept. 12 to Sept. 23...	12	2,139	2,816	541	24	48	27	3.95	8.14	1.53	9.67	
27	Broilers...	800	1,462	1.75	Sept. 13 to Sept. 23...	11	1,400	1,730	328	23	41	24	4.27	8.76	1.66	10.42	
28	Springers...	1,040	2,161	2.08	Sept. 14 to Sept. 24...	11	1,880	2,787	626	29	60	21	2.92	6.08	1.10	7.18	
29	do.....	720	1,517	2.15	Sept. 14 to Sept. 25...	12	1,382	4,092	445	29	62	12	3.11	6.39	1.16	7.55	
30	do.....	720	1,588	2.21	Sept. 16 to Sept. 25...	10	1,445	1,904	316	44	44	4	3.62	7.50	1.56	8.86	

31	do.....	1,280	Sept. 17 to Sept. 26..	1.09
32	do.....	1,560	Sept. 18 to Sept. 29..	3.02
33	do.....	2,774	Sept. 20 to Sept. 30..	6.24
34	do.....	2,322	Sept. 23 to Oct. 1....	3.23
35	do.....	2,905	Sept. 21 to Oct. 1....	3.23
36	do.....	720	Sept. 19 to Oct. 2....	7.67
37	do.....	1,479	Sept. 24 to Oct. 2....	7.67
38	do.....	2,168	Sept. 25 to Oct. 3....	7.12
39	do.....	2,790	Sept. 25 to Oct. 4....	8.56
40	do.....	960	Sept. 25 to Oct. 4....	6.48
41	do.....	720	Sept. 27 to Oct. 6....	1.02
42	do.....	1,200	Sept. 28 to Oct. 7....	1.02
43	do.....	1,360	Sept. 30 to Oct. 8....	1.28
44	do.....	1,360	Oct. 1 to Oct. 8....	1.28
45	do.....	720	Sept. 19 to Oct. 9....	9.11
46	do.....	1,280	Oct. 1 to Oct. 9....	11.95
47	do.....	1,280	Oct. 3 to Oct. 11....	10.46
48	do.....	1,120	Oct. 4 to Oct. 13....	9.96
49	Springers,	2,240	Oct. 5 to Oct. 14....	9.96
50	do.....	880	Oct. 7 to Oct. 15....	7.26
51	do.....	1,600	Oct. 8 to Oct. 16....	6.29
52	do.....	800	Oct. 9 to Oct. 16....	5.97
53	do.....	1,280	Oct. 11 to Oct. 17....	5.97
54	do.....	1,640	Oct. 12 to Oct. 20....	6.11
55	do.....	1,440	Oct. 13 to Oct. 21....	6.11
56	do.....	880	Oct. 15 to Oct. 21....	6.11
57	do.....	800	Oct. 16 to Oct. 24....	6.11
58	do.....	1,680	Oct. 16 to Oct. 25....	6.11
59	do.....	2,720	Oct. 17 to Oct. 27....	6.11
60	Roasters..	1,360	Oct. 18 to Oct. 28....	6.11
61	do.....	720	Oct. 19 to Oct. 28....	7.12
62	do.....	1,120	Oct. 20 to Oct. 30....	7.12
63	do.....	880	Oct. 21 to Nov. 1....	7.12
64	do.....	660	Oct. 23 to Nov. 1....	7.12
65	do.....	800	Oct. 25 to Nov. 3....	7.12
66	Broilers..	480	Oct. 21 to Nov. 3....	5.56
67	Roasters..	480	Oct. 26 to Nov. 4....	5.56
68	do.....	960	Oct. 26 to Nov. 4....	5.56
69	Broilers..	436	Oct. 27 to Nov. 6....	5.56
70	Roasters..	1,360	Oct. 30 to Nov. 7....	5.56
71	do.....	800	Oct. 31 to Nov. 10....	5.56
72	Broilers..	480	Oct. 31 to Nov. 12....	5.56
73	Roasters..	800	Nov. 3 to Nov. 12....	5.56
74	do.....	1,280	Nov. 6 to Nov. 14....	5.56
75	do.....	1,040	Nov. 7 to Nov. 14....	5.56

Details of feeding experiments in 1911 and 1912—Continued.

EXPERIMENT A, STATION 3, 1912—Continued.

Lot.	Class.	Number in.	Total weight in.	Average weight in.	Dates fed.	Pounds fed.	Total feed.	Total weight out.	Total gain.	Per cent gain.	Pounds.	Pounds.	Pounds.	Pounds.	Percent.	Pounds.	Pounds.	Head.	Dead.	Grain per pound of grain.	Total cost of feed per pound of gain.	Cost of labor per pound of grain.	Total cost per pound of gain.
76	Rousters.	640	Head.	Pounds.	Nov. 9 to Nov. 15, ...	1912.	2,224	8	800	2,352	108	313	6	14.29	2,740	2,740	14.29	14.29	14.29	17.08	2.67	16.40	
77	do	1,520	3,24	3,24	Nov. 10 to Nov. 17, ...	2,923	7	2,341	5,236	313	4	10,53	11.13	11.13	19.35	4.42	7.48	10,53	2,402	2,402	2,402	23.37	
78	do	1,720	2,403	2,403	Nov. 12 to Nov. 18, ...	2,403	7	979	2,496	293	4	10,53	11.13	11.13	19.35	4.42	18	2,98	1,42	1,42	1,42	6.55	
79	do	1,350	3,38	3,38	Nov. 13 to Nov. 19, ...	4,603	7	1,863	5,228	625	14	18	18	18	18	10,45	2,12	10,45	5,80	5,80	5,80	12.57	
80	do	1,576	3,55	3,55	Nov. 14 to Nov. 20, ...	3,55	7	.806	2,183	139	7	24	9	24	9	10,45	2,12	10,45	10,45	10,45	10,45	12.57	
81	do	748	3,60	3,60	Nov. 16 to Nov. 21, ...	2,690	15	913	2,850	169	6	23	3	23	3	10,45	9.60	10,45	1.91	1.91	1.91	11.51	
82	Broilers.	288	1,63	1,63	Nov. 16 to Nov. 24, ...	468	15	786	623	155	33	54	9	25	5.07	18.00	18.00	18.00	18.00	18.00	11.19		
83	do	1,560	5,158	5,158	Nov. 17 to Nov. 24, ...	3,31	8	2,122	5,412	254	5	16	16	16	16	10,45	8.35	10,45	2.95	2.95	2.95	18.50	
84	do	3,390	10,389	10,389	Nov. 17 to Nov. 25, ...	3,41	9	5,255	11,001	612	6	18	18	18	18	10,45	8.50	10,45	2.99	2.99	2.99	18.50	
85	do	816	3,48	3,48	Nov. 21 to Nov. 29, ...	2,839	9	1,281	3,038	199	7	24	17	24	17	10,45	6.44	10,45	1.73	1.73	1.73	13.82	

EXPERIMENT B, STATION 1, 1911.

1	Springers.	900	1,615	1.8	July 15 to July 28, ...	1911.	1,506	14	1,506	2,259	614	37	68	5	6.44	2.55	4.44	2.00	6.44	2.83	6.61
2	do	900	1,512	1.8	July 16 to July 30, ...	1911.	1,666	15	1,666	2,187	586	37	65	7	6.44	1.78	4.83	1.78	5.87	2.50	5.87
3	Broilers.	900	1,565	1.7	July 19 to Aug. 1, ...	1911.	1,558	14	1,558	1,435	623	41	60	7	6.44	2.50	4.40	1.40	5.81	2.50	5.81
4	do	900	1,651	1.7	July 20 to Aug. 2, ...	1911.	1,521	14	1,521	2,171	606	39	67	7	6.44	2.51	4.40	1.40	5.81	2.51	5.81
5	Springers.	900	1,651	1.8	July 21 to Aug. 3, ...	1911.	1,539	14	1,539	2,273	628	38	70	7	6.44	2.45	4.39	1.39	5.71	2.45	5.71
6	do	900	1,696	1.9	July 21 to Aug. 5, ...	1911.	1,746	16	1,746	2,167	474	28	52	7	6.76	2.07	3.71	2.07	8.83	2.60	8.83
7	Broilers.	900	1,472	1.6	July 22 to Aug. 6, ...	1911.	1,827	16	1,827	2,174	702	48	78	7	6.76	2.07	4.75	2.07	6.11	2.79	6.11
8	Springers.	900	1,573	1.8	do	1911.	1,755	16	1,755	2,201	628	40	70	10	6.62	2.07	5.11	2.07	5.11	2.83	5.11
9	Broilers.	900	1,370	1.5	July 22 to Aug. 7, ...	1911.	1,872	17	1,872	2,010	640	47	71	5	6.96	2.07	5.38	2.07	5.38	2.93	5.38
10	Springers.	900	1,671	1.9	do	1911.	1,872	17	1,872	2,270	599	36	67	7	6.76	2.07	5.75	2.07	5.75	3.13	5.75
11	do	900	1,590	1.8	July 23 to Aug. 8, ...	1911.	1,919	17	1,919	2,133	543	34	60	8	6.60	1.96	3.63	1.96	3.63	3.55	8.26
12	do	900	1,600	1.8	July 23 to Aug. 8, ...	1911.	1,872	17	1,872	2,128	528	33	59	5	6.29	1.97	3.41	1.97	3.41	3.41	8.57
13	Broilers.	900	1,403	1.6	July 25 to Aug. 9, ...	1911.	1,850	16	1,850	1,948	545	39	61	20	6.55	2.02	4.18	2.02	4.18	2.83	6.60
14	Springers.	900	1,729	1.8	July 26 to Aug. 10, ...	1911.	1,730	16	1,730	2,043	444	25	52	17	6.97	2.02	4.18	2.02	4.18	2.83	9.83
15	do	900	1,729	1.9	July 27 to Aug. 11, ...	1911.	1,714	16	1,714	2,199	470	27	52	4	6.65	2.04	3.65	2.04	3.65	2.49	7.43
16	do	900	1,706	1.9	July 29 to Aug. 13, ...	1911.	1,629	16	1,629	2,267	561	33	62	11	6.01	2.90	6.01	2.90	6.01	2.49	8.13
17	do	900	1,750	1.9	July 31 to Aug. 14, ...	1911.	1,485	15	1,485	2,237	487	28	54	11	6.59	3.05	6.59	3.05	6.59	2.49	8.99
18	do	900	1,887	2.1	Aug. 2 to Aug. 15, ...	1911.	1,308	14	1,308	2,328	441	23	49	14	6.90	2.53	6.90	2.53	6.90	2.53	9.43
19	do	900	1,740	1.9	Aug. 3 to Aug. 16, ...	1911.	1,339	14	1,339	2,182	442	25	49	13	6.99	2.57	6.99	2.57	6.99	2.57	9.56
20	do	900	1,867	2.1	Aug. 4 to Aug. 17, ...	1911.	1,359	14	1,359	2,274	407	22	46	7	7.48	3.34	7.48	3.34	7.48	3.34	10.51

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Results of feeding experiments in 1911 and 1912 (Continued)

THE CERAMIC TRADE IN THE 19TH CENTURY

101	do.....	900	3,127	3.5	Nov. 1 to Nov. 12...	12	1,563	3,408	281	9	31	12	13.45	3.70
102	do.....	900	3,131	3.5	Nov. 2 to Nov. 15...	12	1,557	3,594	463	5.67	11	12	5.36	8.01
103	do.....	900	2,831	3.2	Nov. 3 to Nov. 14...	12	1,566	3,284	453	15	50	7	3.46	2.14
104	do.....	1,800	5,941	3.3	Nov. 4 to Nov. 15...	12	1,066	7,190	1,249	21	69	0	8.27	2.26
105	do.....	900	2,996	3.3	Nov. 5 to Nov. 16...	12	1,530	3,344	348	12	39	10	4.40	10.55
106	do.....	900	3,076	3.4	Nov. 5 to Nov. 17...	13	1,665	3,625	549	18	61	8	3.03	7.30
107	do.....	900	2,964	3.3	Nov. 7 to Nov. 19...	13	1,715	3,452	488	16	54	10	3.51	2.05
108	do.....	900	2,956	3.3	Nov. 8 to Nov. 19...	12	1,521	3,270	314	11	35	8	4.84	11.55
109	do.....	900	3,025	3.4	Nov. 8 to Nov. 20...	13	1,647	3,398	373	12	41	13	4.42	10.52
110	do.....	900	3,151	3.5	Nov. 9 to Nov. 21...	13	1,674	3,400	249	8	28	24	6.72	14.70
111	do.....	900	3,067	3.4	Nov. 10 to Nov. 22...	13	1,674	3,431	364	12	40	16	4.60	10.01
112	do.....	900	3,178	3.5	Nov. 13 to Nov. 23...	11	1,413	3,384	206	7	23	20	6.86	15.94
113	do.....	1,350	4,680	3.5	Nov. 14 to Nov. 23...	10	1,931	5,097	417	9	31	28	4.63	9.31

EXPERIMENT B, STATION 1, 1912.

1	Springers.	900	1,510	1.68	July 29 to Aug. 11...	14	1,568	2,187	677	45	75	21	2.32	5.00
2	do.....	900	1,419	1.58	July 31 to Aug. 13...	14	1,532	2,160	741	52	82	8	2.07	8.00
3	do.....	900	1,504	1.67	Aug. 2 to Aug. 14...	13	1,469	2,096	569	51	74	8	2.20	6.65
4	do.....	900	1,517	1.69	Aug. 6 to Aug. 19...	14	1,399	1,984	467	31	52	10	3.00	6.76
5	do.....	900	1,506	1.67	Aug. 8 to Aug. 20...	13	1,338	2,036	530	35	59	.....	2.52	10.35
6	do.....	900	1,688	1.88	Aug. 9 to Aug. 22...	14	1,435	2,331	643	38	71	71	2.23	5.41
7	do.....	900	1,739	1.95	Aug. 11 to Aug. 25...	14	1,541	2,310	551	31	61	7	2.80	7.77
8	do.....	900	1,711	1.90	Aug. 13 to Aug. 26...	14	1,459	2,296	495	29	55	2	2.95	7.14
9	do.....	900	1,724	1.92	Aug. 14 to Aug. 26...	13	1,376	2,342	618	36	69	6	2.23	5.39
10	do.....	900	1,789	1.99	Aug. 15 to Aug. 27...	13	1,317	2,299	510	29	57	6	2.58	6.24
11	do.....	900	1,720	1.91	Aug. 16 to Aug. 28...	13	1,268	2,184	464	27	52	.....	2.73	5.61
12	do.....	900	1,712	1.90	Aug. 17 to Aug. 29...	13	1,231	2,152	440	26	49	10	2.80	6.77
13	do.....	900	1,627	1.81	Aug. 19 to Aug. 29...	11	1,085	2,187	560	34	62	.....	1.94	4.68
14	do.....	900	1,765	1.85	Aug. 21 to Aug. 30...	10	1,084	2,224	459	26	51	6	2.36	5.71
15	do.....	900	1,729	1.92	..... do.....	10	1,171	2,219	490	28	54	5	2.39	5.78
16	do.....	900	1,771	1.97	Aug. 22 to Sept. 2...	12	1,288	2,318	547	31	61	.....	2.35	5.70
17	do.....	900	1,744	1.94	Aug. 23 to Sept. 3...	12	1,284	2,263	519	30	58	11	2.47	5.98
18	do.....	900	1,730	1.92	Aug. 23 to Sept. 4...	13	1,398	2,342	612	35	68	13	2.28	5.52
19	do.....	900	1,667	1.74	Aug. 24 to Sept. 5...	13	1,402	2,309	742	47	82	5	1.89	4.57
20	do.....	900	1,822	2.02	Aug. 24 to Sept. 6...	14	1,521	2,326	504	28	56	.....	3.02	7.31
21	do.....	900	1,762	1.96	Aug. 26 to Sept. 7...	13	1,379	2,202	440	25	49	33	3.13	7.58
22	do.....	900	1,691	1.88	Aug. 26 to Sept. 9...	15	1,710	2,176	485	29	54	1	3.53	8.11
23	do.....	900	1,559	1.73	Aug. 27 to Sept. 9...	14	1,604	2,244	685	44	76	10	2.34	5.38
24	do.....	900	1,891	2.03	Aug. 28 to Sept. 10...	14	1,607	2,403	572	31	64	17	1.38	6.46
25	do.....	900	1,745	1.94	Aug. 28 to Sept. 11...	15	1,734	2,358	613	35	68	.....	2.83	6.51

Details of feeding experiments in 1911 and 1912—Continued.

EXPERIMENT B, STATION 1, 1912—Continued.

Lot.	Chest.	Number in.	Total weight in.	Average weight in.	Dishes fed.	Days fed.	Total feed.	Days fed.	Total weight out.	Pounds.	Pounds.	Pounds	Per cent gain.	Chin per 100 head.	Dish, Pounds.	Head, Pounds.	Pounds.	Per cent gain.	Chin per pound of gain.	Cost of labor per pound of gain.	Total cost per pound of gain.	
26	Springer	900	1,947	2.16	Aug. 20 to Sept. 12.	13	1,828	2,160	613	613	65.1	55.77	466	32	68	2,98	1.90	.86	8.56	1.46	8.56	
27	do	900	1,826	2.03	Aug. 31 to Sept. 13.	13	1,901	2.16	65.1	65.1	55.77	55.77	466	32	72	10	2.40	6.97	7.43	12.05	1.16	12.05
28	do	900	2,109	2.34	Aug. 31 to Sept. 15.	16	1,980	2.16	65.1	65.1	55.77	55.77	466	32	52	10	4.25	9.77	2.28	1.50	1.11	1.50
29	do	900	1,700	2.00	Aug. 31 to Sept. 16.	17	2.154	2.16	60.1	60.1	50.2	50.2	40.2	45	80	6	2.60	6.18	1.41	1.41	1.11	1.41
30	do	900	1,485	2.24	Sept. 3 to Sept. 16.	14	1,773	2.16	60.2	60.2	50.2	50.2	40.2	30	67	5	2.93	6.74	1.71	1.71	1.41	1.71
31	do	900	1,813	2.01	Sept. 4 to Sept. 17.	14	1,829	2.16	66.2	749	44	44	34.1	11	83	11	2.44	5.61	1.28	1.28	1.11	1.28
32	do	900	1,844	2.05	Sept. 4 to Sept. 18.	14	1,847	2.16	65.5	841	46	46	34.2	11	93	2	2.20	5.05	1.11	1.11	1.11	1.11
33	do	900	1,887	2.10	Sept. 4 to Sept. 19.	14	1,862	2.16	67.0	692	37	37	27.7	77	77	1	2.60	6.19	1.39	1.39	1.38	1.39
34	do	900	2.115	2.35	Sept. 7 to Sept. 10.	13	1,735	2.16	53.0	714	34	34	24.3	59	79	4	2.43	5.59	1.24	1.24	1.24	1.24
35	do	900	2.163	2.30	Sept. 8 to Sept. 11.	13	1,706	2.16	50.8	656	30	30	24.3	53	74	4	2.74	6.31	1.34	1.34	1.34	1.34
36	do	900	2.144	2.38	Sept. 10 to Sept. 22.	13	1,805	2.16	51.6	672	27	27	26.7	64	64	3	3.16	7.26	1.58	1.58	1.58	1.58
37	do	900	2.018	2.30	Sept. 11 to Sept. 21.	13	1,862	2.16	50.3	705	37	37	26.7	63	63	4	2.43	5.60	1.18	1.18	1.18	1.18
38	do	900	2.141	2.38	Sept. 12 to Sept. 24.	13	1,750	2.16	50.8	697	31	31	26.7	66	66	4	2.43	5.63	1.38	1.38	1.38	1.38
39	do	900	2.130	2.37	Sept. 12 to Sept. 26.	14	2,038	2.16	52.5	745	35	35	27.4	74	74	5	2.32	6.28	1.32	1.32	1.32	1.32
40	do	900	2.168	2.41	Sept. 13 to Sept. 26.	14	2,055	2.16	50.4	736	34	34	26.7	63	63	10	2.83	6.51	1.35	1.35	1.35	1.35
41	do	900	2.141	2.38	Sept. 14 to Sept. 27.	14	2,047	2.16	50.7	736	37	37	26.7	64	64	5	2.60	5.99	1.24	1.24	1.24	1.24
42	do	900	2.374	2.64	Sept. 15 to Sept. 30.	15	2,021	2.16	50.4	630	35	35	26.7	63	63	8	3.53	8.11	1.66	1.66	1.66	1.66
43	do	900	2,375	2.64	Sept. 17 to Sept. 30.	14	2,084	2.16	50.4	670	35	35	26.7	62	62	8	3.20	6.02	1.20	1.20	1.20	1.20
44	do	900	2,382	2.65	Sept. 17 to Oct. 1.	15	2,125	2.16	51.5	743	34	34	26.7	63	63	8	2.98	6.86	1.31	1.31	1.31	1.31
45	do	900	2,392	2.68	Sept. 18 to Oct. 1.	14	2,060	2.16	50.0	700	31	31	26.7	61	61	10	2.91	6.68	1.35	1.35	1.35	1.35
46	do	900	2.393	2.40	Sept. 19 to Oct. 1.	13	1,918	2.16	49.8	740	32	32	26.7	63	63	4	2.60	5.89	1.18	1.18	1.18	1.18
47	do	900	2,422	2.60	Sept. 20 to Oct. 6.	17	2,007	2.16	50.7	770	32	32	26.7	66	66	7	3.24	7.46	1.14	1.14	1.14	1.14
48	do	900	2,188	2.43	Sept. 20 to Oct. 7.	18	2,641	2.16	50.8	528	38	38	27.4	74	74	14	3.12	7.17	1.17	1.17	1.17	1.17
49	do	900	2,515	2.82	Sept. 21 to Oct. 8.	18	2,582	2.16	50.8	513	32	32	27.4	74	74	14	3.12	7.17	1.17	1.17	1.17	1.17
50	do	900	2,374	2.63	Sept. 22 to Oct. 9.	18	2,760	2.16	51.8	777	33	33	26.7	66	66	8	3.56	7.62	1.12	1.12	1.12	1.12
51	do	900	2,254	2.50	Sept. 23 to Oct. 10.	18	2,707	2.16	50.0	806	36	36	26.7	63	63	13	3.47	7.31	1.48	1.48	1.48	1.48
52	do	900	2,207	2.55	Sept. 25 to Oct. 11.	16	2,448	2.16	50.5	686	30	30	26.7	64	64	4	3.57	7.64	1.52	1.52	1.52	1.52
53	do	900	2,310	2.50	Sept. 26 to Oct. 11.	16	2,405	2.16	50.5	697	30	30	26.7	64	64	1	3.45	7.44	1.49	1.49	1.49	1.49
54	do	900	2,387	2.65	Sept. 26 to Oct. 12.	17	2,682	2.16	50.4	614	35	35	26.7	63	63	18	3.93	8.44	1.70	1.70	1.70	1.70
55	do	900	2,401	2.68	Sept. 28 to Oct. 14.	17	2,600	2.16	50.5	607	25	25	26.7	66	66	14	4.36	9.33	1.80	1.80	1.80	1.80
56	do	900	2,678	2.98	Sept. 29 to Oct. 14.	16	2,432	2.16	50.5	605	34	34	26.7	63	63	17	2.69	6.76	1.13	1.13	1.13	1.13
57	do	900	2,653	2.95	Sept. 30 to Oct. 15.	16	2,400	2.16	50.5	623	22	22	26.7	64	64	13	4.30	8.90	1.84	1.84	1.84	1.84
58	do	900	2,630	2.81	Oct. 1 to Oct. 16.	16	2,596	2.16	52.2	602	28	28	26.7	64	64	17	3.41	7.47	1.71	1.71	1.71	1.71
59	do	900	2,871	3.08	Oct. 3 to Oct. 17.	16	2,344	2.16	51.8	476	17	17	26.7	63	63	33	4.33	8.00	12.16	12.16	12.16	12.16
60	do	900	2,383	2.65	Oct. 3 to Oct. 18.	16	2,396	2.16	51.8	429	31	31	26.7	64	64	31	4.31	8.27	1.84	1.84	1.84	1.84

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900	2,679	2.98	Oct. 4 to Oct. 20,.....	17	2,500	696	3.59	7.69	1.57	9.26
900	2,617	2.91	Oct. 9 to Oct. 21,.....	14	2,109	3,375	3.25	6.95	8.40	9.45
900	2,440	2.71	Oct. 9 to Oct. 22,.....	14	2,122	3,266	3.25	6.67	1.63	9.30
900	2,495	2.77	Oct. 10 to Oct. 23,.....	14	2,157	3,032	502	24	1.33	7.53
900	2,709	3.01	Oct. 11 to Oct. 24,.....	14	2,181	3,239	744	30	2.24	12.61
900	2,675	2.97	Oct. 12 to Oct. 25,.....	14	2,200	3,220	545	17	2.90	10.37
900	2,864	3.18	Oct. 12 to Oct. 27,.....	16	2,570	3,408	544	19	1.8	4.04
900	2,751	3.06	Oct. 13 to Oct. 28,.....	16	2,586	3,330	579	21	14	4.72
900	2,905	3.23	Oct. 15 to Oct. 29,.....	15	2,450	3,450	545	21	26	4.47
900	2,743	3.05	Oct. 15 to Oct. 30,.....	16	2,494	3,299	556	20	35	4.33
900	2,812	3.12	Oct. 17 to Oct. 31,.....	16	2,511	3,361	667	25	19	9.33
900	2,824	3.14	Oct. 18 to Nov. 1,.....	15	2,361	3,288	476	17	16	2.14
900	2,821	3.13	Oct. 19 to Nov. 3,.....	16	2,620	3,448	627	22	70	11.47
900	2,850	3.17	Oct. 19 to Nov. 4,.....	17	2,688	3,474	624	22	69	11.86
900	2,920	3.24	Oct. 22 to Nov. 5,.....	15	2,376	3,430	510	18	57	8.60
900	2,941	3.27	Oct. 24 to Nov. 6,.....	14	2,195	3,504	563	19	60	1.91
900	2,946	3.27	Oct. 26 to Nov. 7,.....	13	2,138	3,601	635	22	73	10.98
900	2,858	3.18	Oct. 27 to Nov. 8,.....	13	2,125	3,405	547	19	38	2.13
900	2,858	3.18	Oct. 28 to Nov. 10,.....	14	2,200	3,485	627	22	70	10.63
900	2,858	3.18	Oct. 28 to Nov. 10,.....	14	2,200	3,485	627	22	69	11.47
900	2,827	3.14	Oct. 28 to Nov. 11,.....	15	2,405	3,372	545	19	61	2.60
900	2,818	3.13	Oct. 30 to Nov. 12,.....	14	2,206	3,320	502	18	56	2.47
900	2,919	3.24	Oct. 31 to Nov. 13,.....	14	2,334	3,410	491	17	55	12.44
900	3,134	3.48	Nov. 1 to Nov. 14,.....	14	2,221	3,551	417	13	46	10.40
900	3,080	3.42	Nov. 2 to Nov. 15,.....	14	2,215	3,380	300	10	33	8.17
900	2,981	3.31	do.....	14	2,216	3,413	432	14	48	9.17
900	2,910	3.23	do.....	15	2,200	3,331	421	15	47	8.17
900	3,031	3.37	Nov. 5 to Nov. 17,.....	13	2,200	3,442	411	14	46	10.38
900	3,036	3.36	Nov. 6 to Nov. 18,.....	13	2,010	3,550	461	15	51	12.34
900	3,089	3.43	Nov. 6 to Nov. 18,.....	12	1,839	3,297	404	14	45	11.33
900	2,893	3.21	Nov. 7 to Nov. 18,.....	12	1,839	3,297	404	14	45	11.33
900	2,881	3.20	Nov. 8 to Nov. 19,.....	12	1,847	3,564	683	24	76	12.18
900	2,775	3.08	Nov. 9 to Nov. 20,.....	12	1,798	3,336	561	20	62	8.06
900	2,999	3.33	Nov. 10 to Nov. 20,.....	11	1,632	3,460	461	15	51	8.92
900	3,026	3.36	Nov. 10 to Nov. 21,.....	12	1,769	3,448	422	14	47	10.44
900	3,240	3.60	Nov. 12 to Nov. 20,.....	9	1,321	3,470	230	7	26	8
900	2,965	3.29	Nov. 13 to Nov. 22,.....	10	1,470	3,280	315	11	35	8
900	3,021	3.36	Nov. 14 to Nov. 24,.....	11	1,551	3,311	310	10	34	5.00
900	3,338	3.71	Nov. 16 to Nov. 25,.....	10	1,392	3,560	222	7	25	10.60
900	3,331	3.70	Nov. 17 to Dec. 26,.....	10	1,417	3,470	139	4	15	12.27
900	3,259	3.62	Nov. 22 to Dec. 1,.....	10	1,406	3,442	183	6	20	11.53

Details of feeding experiments in 1911 and 1912. Continued.
EXPERIMENT C, STATION 4, 1911.

Lot	Class	Number in.	Average weight in.	Dates fed.	Days fed.	Total weight out.	Total feed.	Gain per 100 head.	Dead.	Grain per pound of gain.	Total cost of feed per pound of gain.	Total cost per pound of grain.
1	Broilers	804	Pounds, 1,258	Pounds, 1.4	June 13 to June 25, ...	13	Pounds, 1,323	Pounds, 1,635	Head, 14	Pounds, 4.71	Cents, 7.70	Cents, 9.22
2	do	192	307	1.6	June 14 to June 27	14	426	383	40	7	9.12	1.84
3	do	336	480	1.4	June 22 to July 4, ...	13	521	515	463	22	7.39	9.52
4	do	240	354	1.5	June 25 to July 8, ...	14	324	412	61	19	5.26	4.30
5	do	320	402	1.5	June 30 to July 12, ...	14	406	624	27	17	3.08	8.12
6	do	384	669	1.6	June 30 to July 13, ...	14	518	807	33	17	2.62	4.41
7	do	720	730	1.6	July 2 to July 16, ...	14	659	928	198	27	4.44	3.33
8	do	320	474	1.5	July 14 to July 17	14	493	626	154	33	5.09	2.62
9	do	448	678	1.5	July 6 to July 10	14	726	926	317	8	2.29	3.62
10	do	706	766	1.6	July 7 to July 20, ...	14	753	986	281	40	6	1.69
11	do	576	1,016	1.8	July 8 to July 20, ...	13	910	1,384	338	32	59	11
12	do	896	1,408	1.6	July 9 to July 22, ...	14	1,559	2,029	621	44	69	14
13	do	704	1,077	1.5	July 11 to July 23, ...	13	1,640	1,426	349	33	50	21
14	do	708	1,226	1.6	July 12 to July 24, ...	13	1,241	1,065	450	37	60	19
15	do	808	1,343	1.6	July 14 to July 27, ...	14	1,772	1,772	420	32	48	47
16	do	1,768	2,443	1.7	July 16 to July 29, ...	14	2,723	3,368	925	38	63	44
17	Springers	900	1,349	1.8	July 18 to July 31, ...	14	1,229	1,783	434	32	67	12
18	do	900	1,718	1.8	July 20 to Aug. 1, ...	13	1,526	2,212	494	99	51	24
19	do	896	1,614	1.8	July 22 to Aug. 2, ...	12	1,317	2,044	430	27	46	10
20	do	1,020	1,869	1.8	July 23 to Aug. 3, ...	12	1,479	2,336	467	25	46	15
21	do	900	1,789	1.9	July 25 to Aug. 5, ...	12	1,363	2,212	413	23	47	19
22	do	1,280	2,169	1.7	July 30 to Aug. 6, ...	12	1,766	2,764	605	28	64	20
23	Broilers	1,080	1,697	1.6	July 27 to Aug. 7, ...	12	1,409	2,280	583	34	30	39
24	do	1,080	2,453	2.0	July 28 to Aug. 8, ...	12	1,560	2,815	362	16	30	44
25	do	1,210	1,927	1.9	July 29 to Aug. 10, ...	13	1,387	2,334	407	21	40	26
26	do	320	560	1.8	July 30 to Aug. 6, ...	8	225	607	107	19	33	4
27	do	320	612	1.9	Aug. 1 to Aug. 9, ...	9	208	678	66	11	21	3
28	do	3,045	1,520	2.0	Aug. 3 to Aug. 14, ...	12	1,718	3,417	302	10	20	57
29	do	1,910	4,017	2.1	Aug. 8 to Aug. 20, ...	13	2,349	4,645	498	12	44	759
30	do	960	1,738	1.8	Aug. 9 to Aug. 18, ...	10	1,883	1,970	237	14	25	6.03

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31	do.....	5,505	2.1	Aug. 11 to Aug. 22...	6,072	10	5.54	2.79	11.64
32	do.....	2,646	2.0	Aug. 10 Aug. 24...	3,142	12	5.54	2.79	8.85
33	do.....	720	2.0	Aug. 13 to Aug. 27...	1,015	13	5.54	2.79	8.56
34	do.....	1,920	3.488	Aug. 10 Aug. 27...	3,836	15	5.54	2.00	7.61
35	do.....	1,680	2.0	Aug. 16 to Aug. 28...	1,015	15	5.54	2.00	6.65
36	do.....	1,350	2.1	Aug. 16 to Aug. 29...	3,380	14	5.54	2.00	6.55
37	do.....	1,040	2.2	Aug. 17 to Aug. 30...	1,541	14	5.54	2.00	6.32
38	do.....	1,600	2.2	Aug. 18 to Aug. 31...	2.295	14	5.54	2.00	7.37
39	do.....	896	2.3	Aug. 19 to Sept. 3...	3,588	15	5.54	2.00	7.37
40	do.....	832	2.037	Aug. 20 to Sept. 4...	722	14	5.54	2.00	7.37
41	do.....	832	1,880	Aug. 21 to Sept. 5...	2.3	14	5.54	2.00	7.37
42	do.....	1,080	2,340	Aug. 24 to Sept. 6...	2.2	14	5.54	2.00	7.37
43	do.....	896	2,073	Aug. 25 to Sept. 7...	2.3	13	5.54	2.00	7.37
44	do.....	256	555	Aug. 26 to Sept. 4...	2.2	13	5.54	2.00	7.37
45	do.....	832	2,053	Aug. 29 to Sept. 10...	2.5	13	5.54	2.00	7.37
46	do.....	1,080	2,548	Aug. 30 to Sept. 11...	2.4	12	5.54	2.00	7.37
47	do.....	1,400	3,471	Aug. 31 to Sept. 11...	3,006	12	5.54	2.00	7.37
48	do.....	1,020	3,206	Sept. 1 to Sept. 12...	2,181	12	5.54	2.00	7.37
49	do.....	1,150	3,741	Sept. 7 to Sept. 12...	2.487	12	5.54	2.00	7.37
50	do.....	1,920	4,359	Sept. 3 to Sept. 13...	2.3	11	5.54	2.00	7.37
51	do.....	384	846	Sept. 3 to Sept. 10...	2.2	8	5.54	2.00	7.37
52	do.....	1,530	3,471	Sept. 6 to Sept. 14...	2.3	9	5.54	2.00	7.37
53	do.....	320	631	Sept. 6 to Sept. 15...	2.0	8	5.54	2.00	7.37
54	do.....	1,640	3,741	Sept. 7 to Sept. 18...	2.3	12	5.54	2.00	7.37
55	do.....	1,280	2,987	Sept. 8 to Sept. 19...	2.3	12	5.54	2.00	7.37
56	do.....	1,400	3,299	Sept. 9 to Sept. 20...	2.4	12	5.54	2.00	7.37
57	do.....	1,400	3,912	Sept. 10 to Sept. 21...	1.325	12	5.54	2.00	7.37
58	Broilers..	704	1,325	Sept. 10 to Sept. 24...	1.9	15	5.54	2.00	7.37
59	Roasters..	704	1,872	Sept. 11 to Sept. 22...	1.872	11	5.54	2.00	7.37
60	do.....	960	2,365	Sept. 13 to Sept. 22...	2.6	10	5.54	2.00	7.37
61	Broilers..	518	853	Sept. 13 to Sept. 26...	1.7	14	5.54	2.00	7.37
62	Roasters..	1,020	2,749	Sept. 14 to Sept. 24...	2.7	11	5.54	2.00	7.37
63	Broilers..	643	1,011	Sept. 14 to Sept. 27...	1.6	14	5.54	2.00	7.37
64	Roasters..	1,010	2,569	Sept. 15 to Sept. 25...	2.5	11	5.54	2.00	7.37
65	do.....	1,280	3,374	Sept. 17 to Sept. 26...	2.8	10	5.54	2.00	7.37
66	Broilers..	512	807	Sept. 17 to Oct. 1...	1.6	15	5.54	2.00	7.37
67	Roasters..	896	2,501	Sept. 19 to Sept. 28...	2.8	10	5.54	2.00	7.37
68	do.....	1,400	3,852	Sept. 20 to Sept. 29...	2.8	10	5.54	2.00	7.37
69	Broilers..	448	737	Sept. 20 to Oct. 3...	1.7	14	5.54	2.00	7.37
70	Roasters..	768	2,277	Sept. 21 to Oct. 1...	3.0	11	5.54	2.00	7.37
71	do.....	768	2,135	Sept. 22 to Oct. 2...	2.8	11	5.54	2.00	7.37
72	do.....	896	2,543	Sept. 23 to Oct. 2...	2.8	10	5.54	2.00	7.37
73	Broilers..	320	545	Sept. 23 to Oct. 5...	1.7	13	5.54	2.00	7.37
74	Roasters..	1,530	4,389	Sept. 24 to Oct. 5...	2.9	10	5.54	2.00	7.37
75	Broilers..	320	522	Sept. 24 to Oct. 8...	1.6	15	5.54	2.00	7.37

Details of feeding experiments in 1911 and 1912—Continued.

EXPERIMENT STATION 4, 1911—Continued

Lod.	Class.	Number in.	Total weight in.	Average weight in.	Dates fed.	Pounds fed.	Total feed.	Pounds fed.	Total weight out.	Total feed.	Pounds fed.	Pounds out.	Pounds fed.	Total cost of feed per pound of gain.	Cost of labor per pound of gain.	Total cost per pound of gain.	
76	Broilers	320	Pounds.	Pounds.	Pounds.	Pounds.	Pounds.	Pounds.	Pounds.	Pounds.	Pounds.	Pounds.	Pounds.	Cents.	Cents.	Cents.	
77	Rousters	960	1.6 3.824	1.6 2.9	Sept. 26 to Oct. 9	11	784	74	193	60	64	4.06	6.65	1.44	1.44	7.96	
78	do	1,410	3.824	2.9	Sept. 27 to Oct. 8	12	1,082	3,380	340	69	8	3.42	6.45	1.26	1.26	7.68	
79	Broilers	320	3.824	2.9	Sept. 28 to Oct. 11	12	2,844	4,732	808	67	12	3.13	6.00	1.00	1.00	6.18	
80	Rousters	896	3.824	3.0	Sept. 29 to Oct. 10	12	1,797	746	207	65	11	3.86	6.28	1.33	1.33	7.41	
81	Broilers	322	5.06	1.6	Sept. 29 to Oct. 12	11	841	686	343	563	24	6.00	6.72	1.20	1.20	6.92	
82	Rousters	896	2.710	3.1	Sept. 30 to Oct. 11	12	1,974	1,314	504	761	4	4.34	7.41	1.56	1.56	8.97	
83	do	1,210	3.827	3.2	Oct. 1 to Oct. 12	12	2,662	4,462	726	19	60	3.67	6.04	1.22	1.22	7.36	
84	Broilers	256	404	1.6	Oct. 1 to Oct. 13	13	550	168	39	62	2	3.83	6.36	1.30	1.30	7.60	
85	Rousters	768	3.317	3.0	Oct. 3 to Oct. 13	11	1,567	2,643	326	14	42	9	1.81	8.01	1.63	1.63	9.61
86	do	701	2.121	3.0	Oct. 4 to Oct. 13	12	1,363	2,515	394	19	56	2	3.97	6.66	1.32	1.32	7.95
87	do	842	2,563	3.1	Oct. 6 to Oct. 16	11	1,880	2,980	426	17	61	0	3.06	6.48	1.31	1.31	7.99
88	do	768	2,314	3.1	Oct. 7 to Oct. 17	11	1,554	2,056	344	15	45	10	1.54	7.64	1.60	1.60	9.11
89	Broilers	192	313	1.6	Oct. 7 to Oct. 19	13	1,633	3,392	79	25	41	9	5.86	9.64	2.01	2.01	11.92
90	Rousters	1,310	1,844	3.1	Oct. 8 to Oct. 18	11	2,734	4,817	633	13	432	432	4.32	8.80	1.80	1.80	8.80
91	Broilers	704	1,008	1.6	Oct. 8 to Oct. 19	12	1,363	4,457	350	33	20	4.30	7.39	1.63	1.63	8.42	
92	Rousters	610	1,834	2.9	Oct. 10 to Oct. 17	8	944	2,402	208	16	42	8	3.51	6.97	1.27	1.27	7.24
93	do	832	2,658	3.1	Oct. 11 to Oct. 20	10	1,548	2,946	388	15	47	6	3.99	6.73	1.52	1.52	8.26
94	Broilers	379	4,579	1.7	Oct. 12 to Oct. 22	11	606	1,041	31	61	3	4.06	6.71	1.60	1.60	8.45	
95	Rousters	1,030	3,181	3.1	Oct. 12 to Oct. 22	11	2,222	3,748	567	18	9	3.74	6.10	1.44	1.44	7.64	
96	do	768	2,346	3.1	Oct. 13 to Oct. 23	11	1,628	2,742	406	17	53	2	1.01	6.62	1.55	1.55	8.17
97	Broilers	320	545	1.6	do	11	678	664	154	29	47	4	1.40	7.42	1.74	1.74	9.16
98	Rousters	1,310	4,236	3.2	Oct. 15 to Oct. 25	10	2,627	4,001	608	60	11	3.01	6.11	1.51	1.51	7.98	
99	do	701	2,204	3.1	Oct. 16 to Oct. 25	9	1,274	2,466	252	11	36	10b	8.16	2.12	2.12	10.28	
100	do	768	2,539	3.3	Oct. 18 to Oct. 25	8	1,252	2,864	315	12	41	7	3.97	6.36	1.66	1.66	8.42
101	Broilers	492	310	1.7	Oct. 18 to Oct. 30	13	405	126	107	34	56	1	4.03	7.36	1.83	1.83	9.19
102	Rousters	768	2,005	3.1	Oct. 20 to Oct. 26	7	1,111	2,820	316	8	58	5	5.48	8.14	2.11	2.11	10.28
103	do	832	2,713	3.3	Oct. 21 to Oct. 30	10	1,664	3,294	278	10	33	16	6.90	9.34	2.31	2.31	11.65
104	do	832	2,713	3.3	Oct. 22 to Oct. 31	10	1,647	3,064	364	13	42	10	4.00	7.37	1.76	1.76	9.13
105	do	256	395	4.5	Oct. 22 to Nov. 1	11	556	404	99	26	39	18	6.62	8.82	2.04	2.04	10.80

106	do	285	1.5	Oct. 24 to Nov. 3....	11	407	389	104	3.91
107	Broilers	1,020	3.315	Oct. 24 to Nov. 1....	9	1,795	3,655	19	6.13
108	do	1,400	4,494	Oct. 24 to Nov. 2....	9	2,408	5,051	33	1.93
109	do	832	2,740	Oct. 25 to Nov. 3....	9	1,414	3,144	12	4.32
110	do	960	3,700	Oct. 26 to Nov. 4....	10	1,757	3,400	40	1.53
111	do	705	2,269	Oct. 28 to Nov. 5....	9	1,188	2,574	16	3.30
112	Broilers	263	419	Oct. 28 to Nov. 6....	12	1,579	2,504	49	7.02
113	Roasters	1,210	3,863	Oct. 29 to Nov. 7....	9	2,021	4,383	13	3.76
114	do	1,704	2,112	Oct. 31 to Nov. 8....	8	1,049	2,339	14	5.89
115	do	1,460	4,969	Nov. 1 to Nov. 8....	8	2,457	5,604	22	1.20
116	Broilers	320	498	1.6	Nov. 1 to Nov. 14....	14	797	638	20
117	do	768	2,319	3.0	Nov. 2 to Nov. 9....	8	721	2,566	49
118	Broilers	1,470	4,467	3.0	Nov. 4 to Nov. 14....	11	2,837	4,800	11
119	Broilers	256	4,409	1.6	Nov. 4 to Nov. 16....	13	579	515	20
120	Roasters	1,470	4,746	3.2	Nov. 5 to Nov. 15....	11	2,822	5,301	11
121	Broilers	320	556	1.7	Nov. 5 to Nov. 16....	12	666	689	28
122	Roasters	2,110	8,860	3.3	Nov. 7 to Nov. 13....	7	2,532	7,094	11
123	do	1,790	5,753	3.2	Nov. 8 to Nov. 19....	12	3,664	5,285	14
124	do	768	2,384	3.1	Nov. 9 to Nov. 20....	12	1,544	2,019	10
125	do	768	2,434	3.2	Nov. 10 to Nov. 21....	12	1,536	2,625	191
126	do	1,080	3,648	3.4	Nov. 12 to Nov. 23....	12	2,160	3,836	188
127	do	768	2,469	3.2	Nov. 15 to Nov. 26....	12	1,528	2,519	50
128	do	893	2,676	3.0	Nov. 19 to Nov. 27....	9	1,348	2,887	211
129	do	640	2,216	3.5	Nov. 21 to Nov. 30....	10	1,088	2,355	139
130	do	704	2,167	3.1	Nov. 24 to Dec. 3....	10	1,190	2,234	67
131	do	448	1,252	2.8	Nov. 29 to Dec. 5....	7	520	1,324	72
132	do	960	3,177	3.3	Dec. 1 to Dec. 10....	10	1,661	3,320	143
133	do	960	3,400	3.5	Dec. 3 to Dec. 11....	9	1,546	3,564	164
134	do	576	1,984	3.4	Dec. 6 to Dec. 15....	8	870	2,145	161

EXPERIMENT C, STATION 4, 1912.

1	Broilers	640	1,052	1.64	June 22 to July 7....	16	1,267	1,451	38	62	10	3.18	5.82	1.96	7.78	
2	do	1,280	2,132	1.67	June 26 to July 10....	15	2,308	2,914	33	61	17	3.03	5.62	2.36	7.88	
3	do	1,285	1,611	1.61	June 30 to July 15....	16	1,416	1,708	423	33	20	3.35	6.11	2.36	8.47	
4	do	560	900	1.61	July 2 to July 16....	15	924	1,191	291	32	8	3.18	5.83	2.31	8.17	
5	do	560	844	1.61	July 3 to July 16....	14	851	1,088	244	29	44	8	3.49	6.40	2.61	9.01
6	do	480	722	1.50	July 4 to July 17....	14	725	902	180	38	15	4.03	7.39	2.91	10.30	
7	do	560	964	1.72	July 6 to July 21....	16	991	1,181	217	23	39	7	4.57	8.47	2.87	11.34
8	do	560	934	1.67	July 10 to July 22....	13	1,133	1,199	21	36	13	3.83	7.18	2.22	9.46	11.34
9	do	480	725	1.51	July 11 to July 23....	13	648	905	180	25	38	10	3.60	6.77	2.06	8.83
10	do	640	1,075	1.68	July 12 to July 23....	12	806	1,278	203	19	32	14	3.97	7.50	2.14	9.64

Details of feeding experiments in 1911 and 1912—Continued.

EXPERIMENT C, STATION 4, 1912—Continued.

Lot.	Class.	Number in.	Total weight in.	Average weight in.	Dates fed.	Days fed.	Total feed.	Total weight out.	Total gain.	Per cent gain.	Gain per 100 head.	Dead.	Dead.	Grain per pound of gain.	Total cost of feed per pound of gain.	Cost of labor per pound of gain.	Total cost per pound of gain.
																Cents.	Cents.
11	Broilers...	1,200	Head Pounds. 1,536	1.28	1912. July 13 to July 24...	12	Pounds. 1,524	1.790	Pounds. 254	Per cent. 17	Pounds. 21	Head Pounds. 6.00	Head Pounds. 24	Pounds. 11.34	14.51		
12	do	2,160	3,615	1.67	July 14 to July 26...	13	2,808	4,219	604	17	28	4.65	8.80	2.47	3.17		
13	do	560	843	1.51	July 16 to July 28...	13	938	1,95	95	11	17	50	7.75	3.95	18.62		
14	do	960	1,599	1.67	July 17 to July 28...	12	1,162	1,691	92	6	90	90	12.60	23.89	6.37	30.26	
15	do	1,600	2,631	1.64	July 17 to July 29...	13	2,080	3,149	518	20	32	44	4.02	7.60	2.04	9.64	
16	do	1,680	2,960	1.52	July 20 to July 31...	12	1,982	3,073	513	20	31	70	3.86	7.14	1.77	8.91	
17	Springers.	1,680	1.76	July 21 to Aug. 1...	12	1,966	3,438	477	16	59	412	7.57	1.90	9.47	9.47		
18	Broilers...	1,600	2,329	1.46	July 22 to Aug. 2...	12	1,872	2,920	591	25	37	62	3.17	5.79	1.49	7.28	
19	do	1,360	2,324	1.71	July 23 to Aug. 4...	13	1,782	2,796	472	20	35	55	6.83	1.70	8.53	8.53	
20	do	560	962	1.72	July 24 to Aug. 5...	13	1,750	1,173	211	22	38	28	3.55	6.40	1.49	7.89	
21	do	1,200	2,028	1.69	do	13	1,608	2,558	530	26	44	27	3.03	5.46	1.27	6.73	
22	Springers.	1,680	2,986	1.78	July 24 to Aug. 6...	14	2,470	3,719	733	25	44	22	3.37	6.07	1.38	7.45	
23	Broilers...	1,440	2,407	1.67	July 25 to Aug. 7...	14	2,189	3,189	782	32	44	34	2.80	5.03	1.09	6.12	
24	do	1,760	2,780	1.58	July 25 to Aug. 8...	13	2,640	3,581	801	29	46	94	3.30	5.93	1.19	7.12	
25	do	1,200	2,053	1.71	do	13	1,800	2,639	586	28	49	37	3.07	5.53	1.11	6.64	
26	do	1,680	2,821	1.68	July 28 to Aug. 9...	13	2,587	3,676	855	30	51	51	5.44	1.04	6.48	6.48	
27	Springers.	1,200	2,123	1.67	July 29 to Aug. 11...	14	2,062	3,676	537	25	28	31	3.03	6.84	1.32	8.16	
28	Broilers...	640	1,004	1.57	July 30 to Aug. 11...	13	1,037	1,343	339	34	33	30	3.06	6.46	1.02	6.48	
29	do	1,760	3,049	1.73	July 31 to Aug. 12...	13	2,869	3,915	866	28*	49	18	3.31	5.93	1.02	7.03	
30	Springers.	1,120	1,980	1.77	Aug. 1 to Aug. 12...	12	1,714	2,471	491	25	44	26	3.49	6.27	1.14	7.41	
31	do	1,600	2,917	1.82	Aug. 2 to Aug. 13...	12	2,480	3,574	657	23	41	26	3.77	6.82	1.22	8.04	
32	do	2,000	3,949	1.97	Aug. 5 to Aug. 14...	10	2,600	4,779	830	21	42	17	3.13	5.69	.99	6.68	
33	do	1,450	1,450	1.65	Aug. 6 to Aug. 14...	12	1,930	1,797	347	24	39	29	2.97	5.40	.96	6.36	
34	Springers.	880	4,578	1.79	Aug. 4 to Aug. 15...	12	3,968	5,798	1,220	26	48	39	3.25	5.94	1.03	6.97	
35	do	2,160	3,861	1.79	Aug. 7 to Aug. 18...	12	3,326	4,921	1,060	28	50	46	3.14	5.73	1.06	6.79	
36	do	1,360	2,610	1.92	Aug. 8 to Aug. 19...	12	2,081	3,169	559	21	41	29	3.72	6.76	1.26	8.02	
37	do	960	1,879	1.96	Aug. 9 to Aug. 20...	11	1,334	2,253	374	20	39	6	3.57	6.52	1.23	7.75	
38	do	1,200	2,361	1.97	Aug. 9 to Aug. 20...	12	1,812	2,869	508	22	42	24	3.57	6.52	1.25	7.77	
39	do	1,760	3,372	1.92	Aug. 10 to Aug. 20...	11	2,429	3,947	575	17	33	45	4.22	7.68	1.50	9.18	
40	do	1,920	3,379	1.86	Aug. 11 to Aug. 21...	11	2,669	4,451	872	45	38	45	5.57	5.57	1.08	6.65	

41	do.....	1,200	2,336	1.95	Aug. 12 to Aug. 22...	11	1,704	2,864	5.36	3.23	1.14	7.00	
42	do.....	880	1,703	1.94	Aug. 10 to Aug. 22...	13	1,447	2,064	5.06	4.47	1.44	8.85	
43	do.....	2,320	4,468	1.93	Aug. 14 to Aug. 23...	10	3,016	5,367	6.09	7.36	1.21	7.30	
44	do.....	1,200	2,334	1.95	Aug. 15 to Aug. 25...	11	1,728	2,815	481	40	5	7.86	
45	do.....	2,409	2,01	Aug. 16 to Aug. 25...	10	1,500	2,818	409	17	3.81	1.41	8.39	
46	do.....	1,700	3,333	1.89	Aug. 17 to Aug. 26...	10	2,288	4,044	711	21	40	88	3.22
47	do.....	1,700	3,554	2.02	Aug. 18 to Aug. 27...	10	2,270	4,247	693	20	39	24	3.28
48	do.....	1,680	3,632	2.17	Aug. 18 to Aug. 28...	11	2,335	4,244	590	16	35	7	5.87
49	do.....	1,520	3,133	2.06	Aug. 20 to Aug. 29...	10	1,961	3,682	549	* 18	36	17	3.96
50	do.....	2,080	4,391	2.11	Aug. 21 to Aug. 30...	10	2,683	5,320	929	21	45	21	2.89
51	do.....	1,360	2,695	1.98	Aug. 22 to Sept. 2...	12	2,081	3,293	598	22	44	17	3.48
52	do.....	1,800	3,865	2.15	Aug. 23 to Sept. 3...	12	2,700	4,698	833	22	46	21	3.24
53	do.....	1,600	3,247	2.03	Aug. 24 to Sept. 4...	12	2,384	3,900	653	20	41	25	3.65
54	do.....	1,700	3,826	2.17	Aug. 25 to Sept. 5...	12	2,622	4,687	861	23	49	9	3.05
55	do.....	1,700	3,867	2.20	Aug. 26 to Sept. 6...	12	2,622	4,614	747	19	42	21	3.51
56	do.....	640	1,179	1.84	Aug. 27 to Sept. 8...	13	1,056	1,563	384	33	60	11	2.75
57	do.....	1,440	1,806	1.95	Aug. 28 to Sept. 8...	12	2,023	3,660	854	30	59	14	2.58
58	do.....	1,280	2,812	2.20	Aug. 29 to Sept. 9...	12	1,971	3,341	529	19	41	7	3.73
59	do.....	1,600	3,484	2.18	Aug. 30 to Sept. 9...	11	2,272	4,119	625	18	39	15	3.64
60	do.....	1,280	2,878	2.25	Aug. 31 to Sept. 10...	11	1,830	3,340	462	16	36	4	3.96
61	do.....	2,720	6,089	2.24	Sept. 1 to Sept. 11...	11	3,862	7,149	1,060	17	39	15	3.64
62	do.....	360	1,213	2.17	Sept. 3 to Sept. 12...	10	739	1,508	295	24	53	4	1.99
63	do.....	1,120	2,462	2.22	Sept. 4 to Sept. 15...	12	1,859	3,042	560	23	50	24	3.32
64	do.....	1,440	3,048	2.12	Sept. 5 to Sept. 16...	12	2,448	3,810	762	25	53	31	5.69
65	do.....	1,520	3,254	2.14	Sept. 6 to Sept. 16...	11	2,371	4,080	826	25	54	18	2.87
66	do.....	1,920	4,316	2.25	Sept. 7 to Sept. 17...	11	3,072	5,243	927	22	48	46	3.31
67	do.....	1,680	3,904	2.22	Sept. 9 to Sept. 18...	10	2,520	4,827	923	24	55	29	2.73
68	do.....	1,600	3,751	2.34	Sept. 9 to Sept. 19...	11	2,672	4,597	846	23	53	32	3.16
69	do.....	1,200	2,596	2.16	Sept. 11 to Sept. 20...	10	1,884	3,385	789	30	66	18	2.39
70	do.....	1,600	3,567	2.25	Sept. 12 to Sept. 22...	11	2,832	4,637	1,040	29	65	6	2.72
71	Broilers...	640	730	1.23	Sept. 9 to Sept. 22...	14	1,376	1,096	306	39	46	46	7.95
72	Springers...	1,280	3,027	2.36	Sept. 13 to Sept. 23...	11	2,317	3,807	780	26	61	14	2.97
73	do.....	1,520	3,837	2.52	Sept. 14 to Sept. 23...	10	2,493	4,519	682	18	45	16	3.66
74	do.....	1,600	3,664	2.29	Sept. 15 to Sept. 24...	10	2,656	4,472	808	22	51	25	3.29
75	do.....	1,440	3,379	2.35	do...	10	2,390	4,107	728	22	51	33	3.28
76	do.....	1,600	3,933	2.46	Sept. 18 to Sept. 25...	8	2,176	4,618	685	17	43	35	3.18
77	do.....	960	2,251	2.34	Sept. 17 to Sept. 25...	9	1,459	2,706	455	26	47	26	5.65
78	do.....	2,160	5,316	2.46	Sept. 19 to Sept. 26...	8	2,916	6,298	982	18	46	10	5.35
79	do.....	1,840	4,691	2.55	Sept. 20 to Sept. 26...	7	5,458	767	1,030	16	42	8	2.86
80	do.....	2,160	5,323	2.46	Sept. 21 to Sept. 29...	9	3,477	6,353	5,353	31	48	31	5.98

Details of feeding experiments in 1911 and 1912—Continued.

EXPERIMENT C, STATION 4, 1912—Continued.

Lot.	Class.	Number in.	Total weight in.	Average weight in.	Dates fed.	Days fed.	Total feed.	Total weight out.	Total gain.	Per cent gain.	Gain per 100 head.	Dead.	Grain per pound of gain.	Total cost of feed per pound of gain.	Cost of labor per pound of gain.	Total cost per pound of gain.	Cents.	
81	Springers..	1,200	2,981	2,438	1912	Sept. 22 to Sept. 29.	8	Pounds.	Pounds.	Pounds.	Pounds.	1,716	3,499	518	3,311	3,88	6.78	
82	do	1,040	2,716	2,611	do	Sept. 22 to Sept. 30.	9	1,695	3,349	633	23	61	2,68	4,70	.72	.72	.72	
83	do	2,080	4,943	2,38	do	do	9	3,390	6,163	1,220	25	59	2,78	4,88	.75	.63	.75	
84	do	2,160	5,454	2,53	Sept. 24 to Oct. 1.	8	3,197	6,504	1,050	19	48	35	3,04	5,29	.84	.63	.84	
85	do	1,840	4,522	2,46	Sept. 25 to Oct. 2....	8	2,723	5,506	984	22	54	9	2,77	4,84	.77	.61	.77	
86	do	2,080	5,387	2,59	Sept. 26 to Oct. 3....	8	3,099	6,359	972	18	47	10	3,19	5,56	.90	.64	.64	
87	do	880	2,157	2,45	Sept. 27 to Oct. 4....	7	1,162	2,482	325	15	5	5	3,58	6,17	.98	.75	.75	
88	do	1,200	2,916	2,43	Sept. 28 to Oct. 4....	8	1,764	3,543	627	22	52	33	2,81	4,92	.80	.57	.57	
89	do	1,840	4,466	2,43	Sept. 28 to Oct. 4....	7	2,337	5,099	633	14	34	34	3,69	6,39	1.05	7.44	7.44	
90	do	2,800	6,758	2,41	Sept. 29 to Oct. 6....	8	3,780	7,898	1,40	17	40	32	3,32	5.92	.93	.65	.65	
91	do	720	1,873	2,60	do	Oct. 1 to Oct. 7....	8	972	2,100	227	12	32	14	4,28	7.64	1.21	8.85	8.85
92	do	2,720	6,571	2,42	Oct. 1 to Oct. 7....	7	3,125	7,701	1,130	17	41	26	2,77	5.03	.82	.58	.58	
93	do	2,080	5,049	2,33	Oct. 2 to Oct. 9....	8	2,746	6,046	997	20	38	24	2,75	4.94	.86	.64	.64	
94	do	1,440	3,551	2,47	Oct. 3 to Oct. 9....	8	1,642	4,087	536	15	37	17	3,06	5.48	1.07	.95	.95	
95	do	800	1,733	2,17	Oct. 3 to Oct. 10....	8	1,056	2,044	311	18	39	27	3,40	6.05	1.08	7.13	7.13	
96	do	2,640	6,581	2,49	Oct. 5 to Oct. 11....	7	3,062	7,741	1,160	18	44	19	2,64	4.67	.82	.54	.54	
97	do	2,400	6,532	2,73	Oct. 6 to Oct. 14....	9	3,648	7,612	1,060	16	44	24	3,44	6.09	.97	.70	.70	
98	do	1,700	4,167	2,37	Oct. 6 to Oct. 15....	10	2,974	5,227	1,060	15	60	16	2,81	5.03	.80	.58	.58	
99	do	1,840	4,620	2,51	Oct. 8 to Oct. 15....	8	2,558	5,419	799	17	33	12	3,20	5.64	.92	.65	.65	
100	do	1,440	3,457	2,40	Oct. 9 to Oct. 16....	8	2,002	4,066	609	18	42	21	3,29	5.82	.92	.74	.74	
101	Broilers..	800	1,482	1,85	Oct. 8 to Oct. 16....	9	1,248	1,856	374	25	47	16	3,34	5.90	.96	.68	.68	
102	do	1,760	4,408	2,50	Oct. 10 to Oct. 17....	8	2,446	5,269	861	20	49	27	3,24	5.01	.75	.59	.59	
103	do	1,920	4,541	2,37	Oct. 11 to 18....	8	2,650	5,420	879	19	46	12	2,96	5.35	.83	.618	.618	
104	Broilers..	720	1,245	1,73	Oct. 12 to Oct. 20....	9	1,123	1,602	357	29	49	15	3,15	6.15	.84	.64	.64	
105	do	2,960	2,85	do	do	do	9	1,622	3,430	470	16	45	13	3,45	6.15	.89	7.04	7.04
106	Broilers..	1,120	1,917	1,71	Oct. 13 to Oct. 23....	11	2,128	2,558	641	34	57	14	3,22	5.91	.89	6.80	6.80	
107	Roasters..	1,760	4,972	2,83	Oct. 15 to Oct. 23....	9	2,763	5,839	867	17	49	15	3,19	5.64	.89	6.53	6.53	
108	Broilers..	960	1,600	1,67	Oct. 15 to Oct. 24....	10	1,690	2,085	485	30	51	17	3,48	6.18	.97	7.15	7.15	
109	Roasters..	1,040	3,156	3,03	Oct. 16 to Oct. 24....	9	1,633	3,156	359	11	35	20	4,58	8.14	1.28	9.42	9.42	
110	do	1,139	1,78	Oct. 16 to Oct. 25....	10	1,133	1,446	307	48	36	13	3,69	6.52	1.04	7.56	7.56		

111	Roasters...	1,200	3,676	3,06	Oct. 17 to Oct. 25...	9	1,908	4,169	493	13	41	14	3.87	6.86
112	Broilers...	1,120	1,886	1,68	Oct. 18 to Oct. 27...	11	2,173	2,480	594	32	53	20	3.66	* 6.52
113	Roasters...	1,680	4,785	2,45	Oct. 18 to Oct. 27...	10	2,990	5,462	677	14	42	32	4.42	7.87
114	do...	1,120	3,409	3,04	Oct. 19 to Oct. 28...	10	1,994	3,775	366	11	33	14	5.45	9.73
115	Broilers...	560	953	1.70	Oct. 18 to Oct. 28...	11	1,098	1,219	266	28	48	10	4.13	7.35
116	Roasters...	1,360	4,118	3,03	Oct. 19 to Oct. 29...	11	2,652	4,636	518	13	38	15	5.12	9.14
117	do...	1,280	3,867	3,02	Oct. 20 to Nov. 30...	9	2,035	4,213	346	9	27	26	5.88	10.47
118	Broilers...	800	1,336	1.67	Oct. 20 to Nov. 4...	16	2,272	1,811	475	36	59	22	4.78	8.52
119	do...	880	1,581	1.80	Oct. 22 to Nov. 5...	15	2,323	2,010	429	27	49	40	5.41	9.64
120	Roasters...	720	2,181	3,03	Oct. 25 to Nov. 6...	13	1,627	2,565	384	18	53	13	4.24	7.50
121	Broilers...	480	805	1.68	Oct. 24 to Nov. 6...	14	1,176	1,071	266	33	55	13	4.42	7.83
122	Roasters...	1,520	4,688	3,08	Oct. 27 to Nov. 7...	12	3,131	5,281	593	13	39	20	5.28	9.24
123	do...	800	2,564	3.67	Oct. 26 to Nov. 7...	13	1,792	2,783	229	9	29	11	6.83	11.00
124	Broilers...	560	927	1.66	Oct. 27 to Nov. 8...	13	1,249	1,272	345	37	62	3	3.62	16.32
125	Roasters...	880	2,734	3.11	Oct. 29 to Nov. 9...	11	1,654	3,053	319	12	36	10	5.19	9.55
126	do...	1,040	3,223	3.10	Oct. 30 to Nov. 11...	13	2,319	3,624	401	12	39	20	5.78	9.96
127	Broilers...	480	793	1.65	do...	13	1,070	1,027	234	30	44	13	5.15	9.40
128	Roasters...	720	2,100	2.92	Oct. 31 to Nov. 12...	13	1,627	2,416	316	15	51	27	4.47	8.77
129	Broilers...	480	785	1.64	do...	13	1,085	1,028	243	31	49	7	6.0	1.46
130	do...	640	1,035	1.62	Nov. 3 to Nov. 14...	12	1,318	1,348	313	30	49	37	4.21	6.10
131	Roasters...	1,280	4,043	3.16	do...	12	2,637	4,575	535	13	42	23	4.93	8.30
132	do...	880	2,800	3.18	Nov. 5 to Nov. 15...	11	1,681	3,156	356	13	40	11	4.57	7.81
133	do...	960	2,828	2.95	Nov. 6 to Nov. 17...	12	1,997	3,213	385	14	40	16	5.19	8.58
134	Broilers...	720	1,264	1.76	Nov. 5 to Nov. 17...	13	1,678	1,622	358	28	50	22	7.46	1.49
135	do...	400	633	1.58	Nov. 5 to Nov. 18...	13	900	833	210	33	53	10	4.29	7.10
136	Roasters...	800	2,469	3.09	Nov. 8 to Nov. 18...	11	1,536	2,781	312	13	39	10	4.92	8.23
137	Broilers...	400	652	1.63	Nov. 8 to Nov. 19...	12	1,840	2,849	197	30	49	8	4.26	7.11
138	do...	400	674	1.69	Nov. 9 to Nov. 20...	12	1,844	943	269	40	67	3	3.14	1.10
139	Roasters...	1,920	6,337	3.14	Nov. 10 to Nov. 20...	11	3,725	6,777	740	12	39	25	5.03	8.35
140	do...	640	1,973	3.08	Nov. 12 to Nov. 21...	10	1,120	2,165	192	10	30	10	5.83	9.70
141	Broilers...	560	1,890	1.59	Nov. 10 to Nov. 21...	12	1,170	1,206	316	35	56	10	3.70	6.17
142	Roasters...	1,040	3,338	3.21	Nov. 13 to Nov. 25...	13	2,319	3,672	334	7	32	40	6.94	11.40
143	do...	880	2,822	3.21	Nov. 14 to Nov. 25...	12	1,804	3,103	281	10	32	20	6.42	10.52
144	do...	1,200	4,179	3.48	Nov. 15 to Nov. 26...	12	2,436	4,419	240	6	20	36	10.15	16.65
145	do...	2,160	7,304	3.38	Nov. 17 to Nov. 28...	12	4,277	7,730	426	6	58	10	10.04	16.38
146	Broilers...	320	1,536	1.68	Nov. 15 to Nov. 28...	14	7,752	6,688	152	28	48	17	4.95	8.09
147	do...	640	1,038	1.62	Nov. 16 to Nov. 28...	13	1,376	1,284	246	24	38	30	3.59	9.16

EXPERIMENT D, STATION 2, 1911.

Details of feeding experiments in 1911 and 1912—Continued.

Lot.	Class.	Number in.	Total weight in.	Average weight in.	Dates fed.	Days fed.	Total feed.	Total weight out.	Pounds.	Pounds.	Per cent. gain.	Gain per 100 head.	Total cost of feed per pound of gain.	Cost of labor per pound of gain.	Total cost per pound of gain.	
1	Broilers	480	Pounds.	1.7	1911.	July 25 to Aug. 7...	14	Pounds.	979	Pounds.	38		Cents.	1.26		
2	do.	800	1.379	1.7	July 27 to Aug. 10...	15	1,664	1,143	484	35	61	9	7.15	7.74		
3	Springers	900	2.008	2.1	July 28 to Aug. 11...	15	1,968	1,863	511	25	53	21	3.44	6.45		
4	do.	1,360	2.462	1.8	July 29 to Aug. 14...	17	3,033	2,519	898	37	66	18	3.85	6.63		
5	do.	800	1.401	1.8	July 30 to Aug. 14...	16	1,688	1,683	452	32	57	26	3.38	6.63		
6	do.	640	1,145	1.8	Aug. 1 to Aug. 15...	15	1,286	1,541	396	35	62	14	3.25	6.37		
7	do.	1,120	2,129	1.9	Aug. 2 to Aug. 16...	15	2,262	2,608	479	23	49	56	4.72	9.24		
8	do.	720	1,346	1.9	Aug. 4 to Aug. 17...	14	1,310	1,618	272	20	38	23	4.82	9.61		
9	do.	1,500	2,906	1.9	Aug. 5 to Aug. 18...	14	2,745	3,464	558	19	49	43	4.92	9.79		
10	do.	1,880	3,599	1.9	Aug. 6 to Aug. 20...	15	3,666	4,597	998	28	53	50	3.67	7.35		
11	do.	400	718	1.8	Aug. 8 to Aug. 22...	15	764	920	202	28	51	14	3.78	7.56		
12	do.	1,100	2,102	1.9	Aug. 11 to Aug. 24...	14	2,035	2,726	624	30	57	28	3.26	6.56		
13	do.	2,540	5,182	2.0	Aug. 12 to Aug. 27...	16	6,516	1,334	6,516	26	53	96	4.21	8.33		
14	do.	560	1,122	2.0	Aug. 15 to Aug. 29...	15	1,193	1,501	379	34	68	13	3.15	6.32		
15	do.	560	1,234	2.2	Aug. 18 to Aug. 31...	14	1,142	1,592	358	29	64	15	3.19	6.48		
16	do.	1,600	3,533	2.2	Aug. 20 to Sept. 3...	15	3,584	4,517	984	28	62	32	3.64	7.41		
17	do.	882	1,887	2.2	Aug. 21 to Sept. 5...	13	1,639	2,403	546	29	66	9	4.51	7.41		
18	do.	1,150	2,676	2.3	Aug. 24 to Sept. 7...	14	2,373	3,434	758	28	66	9	3.13	6.05		
19	do.	1,020	2,401	2.4	Aug. 26 to Sept. 7...	13	1,925	3,066	665	28	65	13	2.89	5.79		
20	do.	1,470	3,238	2.2	Aug. 27 to Sept. 10...	15	3,165	4,321	1,083	33	74	24	2.92	5.76		
21	do.	1,100	2,510	2.3	Aug. 29 to Sept. 6...	9	1,408	3,045	535	21	49	5	2.63	5.35		
22	do.	1,060	2,399	2.3	Aug. 31 to Sept. 13...	14	2,162	3,158	759	32	72	11	2.85	5.67		
23	do.	1,140	2,683	2.4	Sept. 1 to Sept. 14...	14	2,311	3,279	596	22	52	19	3.88	7.71		
24	do.	1,480	3,202	2.2	Sept. 2 to Sept. 11...	10	2,161	3,997	795	25	54	24	2.72	5.31		
25	do.	1,380	3,162	2.3	Sept. 3 to Sept. 12...	10	1,975	3,870	708	22	51	13	2.79	5.36		
26	Broilers	512	1,065	2.1	Sept. 6 to Sept. 19...	14	1,055	1,418	353	33	69	17	2.99	6.01		
27	do.	768	1,419	1.9	Sept. 7 to Sept. 20...	14	1,628	1,984	515	36	67	33	3.16	6.38		
28	Roasters	572	1,278	2.0	Sept. 7 to Sept. 15...	9	1,744	1,562	284	22	50	12	2.62	5.26		
29	Broilers	560	1,120	2.0	Sept. 8 to Sept. 21...	14	1,193	1,430	310	28	55	10	3.85	7.86		
	Roasters	864	2,301	2.7	Sept. 8 to Sept. 15...	8	994	2,483	182	21	15	11	5.46	13.24		

Details of feeding experiments in 1911 and 1912—Continued.

EXPERIMENT D, STATION 2, 1911—Continued.

Lot.	Class.	Number in.	Total weight in.	Average weight in.	Dates fed.	Days fed.	Total feed.	Total weight out.	Per cent gain.	Gain per 100 head.	Dead.	Grain per pound of gain.	Total cost of feed per pound of gain.	Cost of labor per pound of gain.	Total cost per pound of gain.			
76	Roasters..	1,020	Pounds.	1911.	Oct. 18 to Oct. 25....	8	Pounds.	268	Per cent.	12	Pounds.	8	Cents.	1.55	11.03			
77	do.....	1,610	3,146	3.1	Oct. 19 to Oct. 26....	8	2,560	3,514	620	12	39	18	8.93	1.28	10.41			
78	Broilers..	400	5,029	3.1	Oct. 20 to Nov. 2....	14	1,080	5,649	844	195	30	49	5.55	2.36	14.55			
79	Roasters..	900	6,649	1.6	Oct. 21 to Oct. 27....	8	1,516	3,506	307	9	32	11	5.04	1.09	12.75			
80	do.....	956	3,201	3.3	Oct. 21 to Oct. 27....	7	1,358	3,388	374	12	39	7	3.63	1.33	9.15			
81	do.....	do.....	3,014	3.2	Oct. 22 to Oct. 29....	8	2,099	4,544	517	13	40	19	4.06	8.96	1.64	10.50		
82	Broilers..	1,280	4,027	3.2	Oct. 22 to Nov. 3....	13	1,806	734	197	37	62	12	4.09	9.08	1.71	10.79		
83	Roasters..	320	5,337	1.7	Oct. 22 to Nov. 3....	8	1,806	2,867	343	14	41	13	3.76	8.32	1.62	9.34		
84	do.....	832	2,524	3.0	Oct. 24 to Oct. 31....	8	2,205	2,867	513	11	35	24	4.30	9.77	1.92	11.79		
85	do.....	1,470	4,642	3.2	Oct. 26 to Nov. 2....	8	1,876	2,005	515	11	35	28	4.03	8.96	1.85	10.81		
86	do.....	1,340	4,414	3.3	Oct. 29 to Nov. 5....	8	1,876	4,879	465	11	35	28	4.03	8.96	1.85	10.81		
87	do.....	do.....	do.....	1,280	3,944	3.1	Nov. 1 to Nov. 7....	7	1,574	4,273	329	8	26	8	4.79	10.58	1.99	12.57
88	do.....	1,340	4,231	3.2	Nov. 2 to Nov. 9....	7	1,675	4,762	531	13	40	12	3.15	6.79	1.26	8.05		
89	do.....	1,140	3,817	3.4	Nov. 4 to Nov. 9....	6	1,186	4,120	303	8	27	15	3.91	8.28	1.50	9.78		
90	do.....	do.....	1,700	5,540	3.3	Nov. 7 to Nov. 13....	7	2,227	6,044	454	8	27	24	4.91	9.92	1.57	11.49	
91	do.....	do.....	1,800	5,624	3.1	Nov. 8 to Nov. 14....	7	2,358	6,086	462	8	26	18	5.10	10.09	1.68	11.77	
92	do.....	do.....	2,040	6,482	3.2	Nov. 9 to Nov. 15....	7	2,754	7,242	700	12	37	8	3.62	7.41	1.15	8.56	
93	do.....	do.....	2,130	6,768	3.2	Nov. 10 to Nov. 16....	7	2,876	7,385	617	9	29	33	4.66	9.46	1.52	10.98	
94	do.....	do.....	1,330	4,459	3.4	Nov. 11 to Nov. 19....	9	2,221	4,778	319	7	24	8	6.96	14.47	2.50	16.97	
95	do.....	do.....	1,240	3,766	3.0	Nov. 12 to Nov. 19....	8	1,872	4,066	300	8	24	23	6.24	13.06	2.31	15.37	
96	do.....	do.....	3,563	3.0	Nov. 15 to Nov. 21....	7	1,525	3,971	376	11	31	16	4.06	8.88	1.64	10.52		
97	do.....	do.....	1,340	4,062	3.0	Nov. 17 to Nov. 22....	6	1,380	4,374	312	8	23	13	4.42	9.66	1.89	11.55	
98	do.....	do.....	1,080	4,316	3.2	Nov. 18 to Nov. 24....	6	1,434	4,666	350	8	26	15	4.10	8.77	1.76	10.53	
99	do.....	do.....	1,530	3,596	3.3	Nov. 22 to Nov. 27....	6	1,220	3,786	190	5	18	17	6.42	13.47	2.62	16.09	
100	do.....	do.....	1,080	3,592	3.3	Nov. 24 to Nov. 30....	7	1,958	5,645	117	2	8	27	16.74	35.31	6.80	42.11	
101	do.....	do.....	1,530	5,114	3.3	Nov. 26 to Dec. 1....	6	1,112	3,914	322	9	30	4	3.45	7.48	1.41	8.89	
102	do.....	do.....	896	3,416	3.8	Dec. 3 to Dec. 8....	6	1,760	5,593	479	9	21	16	3.67	8.08	1.34	9.42	
103	do.....	do.....	768	2,449	3.2	Dec. 6 to Dec. 11....	6	1,030	3,488	72	2	8	16	14.31	30.86	6.72	37.58	
													2,667	9.06	2.39	11.45		

EXPERIMENT D, STATION 2, 1912.

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1	Springers	800	1,488	1912.	Aug. 7 to Aug. 20....	14	1,512	1,834	346	23	43	17	4.37	10.27	1.66	11.93
2	do.....	480	919	1,91	do. to Aug. 20....	15	974	1,536	201	22	42	7	4.85	11.51	1.86	13.37
3	do.....	1,840	3,496	1.90	do. to Aug. 23....	16	938	4,536	1,040	30	57	31	3.79	8.90	1.36	13.36
4	do.....	400	786	1.97	Aug. 10 to Aug. 25....	16	812	960	174	22	44	15	4.67	10.92	1.68	12.60
5	do.....	640	1,104	1.73	Aug. 9 to Aug. 25....	17	1,440	1,465	381	35	60	6	3.78	8.78	1.36	10.14
6	do.....	1,600	2,882	1.80	Aug. 11 to Aug. 26....	16	232	3,529	647	22	40	45	4.99	11.67	1.83	13.50
7	do.....	640	1,234	1.93	Aug. 13 to Aug. 27....	15	171	1,532	298	24	47	19	3.93	9.15	1.44	10.59
8	do.....	1,040	1,957	1.88	Aug. 14 to Aug. 28....	15	862	2,455	498	25	48	28	3.74	8.73	1.38	10.11
9	do.....	320	621	1.94	Aug. 16 to Aug. 29....	14	515	666	44	7	14	18	11.70	27.20	4.50	31.70
10	do.....	400	831	2.08	Aug. 15 to Aug. 29....	15	704	949	118	14	30	24	5.97	13.93	2.24	16.17
11	do.....	800	1,623	2.03	Aug. 17 to Aug. 30....	14	1,264	1,853	230	14	29	35	5.50	12.80	2.19	14.99
12	do.....	1,480	3,678	2.49	Aug. 19 to Sept. 1....	14	2,383	4,521	843	23	57	47	4.99	12.83	6.48	15.60
13	do.....	580	1,175	2.03	Sept. 2....	12	818	1,446	271	23	47	11	3.02	6.88	1.20	8.03
14	do.....	660	1,414	2.14	Sept. 2....	13	1,023	1,667	253	18	38	14	4.04	9.21	1.54	10.75
15	do.....	820	1,631	1.99	Sept. 2....	14	1,337	2,000	369	23	45	12	3.62	8.24	1.42	9.66
16	do.....	704	1,564	2.21	Aug. 23 to Sept. 3....	12	1,007	1,758	204	13	29	9	4.94	11.04	1.97	13.01
17	do.....	704	1,495	2.12	Aug. 24 to Sept. 3....	11	915	1,767	272	18	39	6	3.36	7.48	1.37	8.85
18	do.....	448	1,000	2.23	Aug. 27 to Sept. 4....	9	483	1,196	196	20	44	3	2.46	5.51	1.03	6.54
19	do.....	2,140	2,576	2.14	Sept. 4....	11	261	5,464	888	19	42	30	3.11	6.96	1.30	8.23
20	do.....	640	1,227	1.92	Sept. 8....	11	864	1,498	271	22	42	5	3.19	7.11	1.42	8.53
21	do.....	1,280	2,689	2.10	Sept. 28 to Sept. 8....	12	1,869	3,184	495	18	39	12	3.78	8.43	1.68	10.11
22	do.....	448	2,066	2.06	Sept. 31 to Sept. 9....	10	1,556	1,104	182	20	41	4	3.06	7.34	1.40	8.74
23	do.....	896	1,897	2.12	Sept. 31 to Sept. 10....	11	210	1,052	155	8	17	8	7.81	17.57	3.64	21.24
24	do.....	3,380	7,334	2.17	Sept. 1 to Sept. 11....	11	4,664	8,424	1,090	15	32	23	4.28	9.80	2.05	11.85
25	do.....	240	543	2.26	Sept. 3 to Sept. 11....	9	276	623	80	15	3	13	3.45	10.95	1.71	12.66
26	do.....	692	1,443	2.09	Sept. 4 to Sept. 15....	12	1,135	1,763	320	22	46	10	3.55	8.07	1.62	9.69
27	do.....	512	1,123	2.19	Sept. 5 to Sept. 15....	11	778	1,352	229	20	45	20	3.40	7.74	1.54	9.28
28	do.....	1,470	3,235	2.20	Sept. 6 to Sept. 16....	11	2,323	4,096	860	27	59	35	2.70	6.14	1.16	7.30
29	do.....	1,760	3,871	2.20	Sept. 7 to Sept. 17....	11	2,851	4,725	854	22	49	33	3.34	7.42	1.38	8.80
30	do.....	1,380	3,084	2.23	Sept. 8 to Sept. 18....	11	2,318	3,757	673	22	49	38	3.44	7.57	1.33	8.90
31	do.....	384	802	2.09	Sept. 10 to Sept. 18....	9	5,330	1,007	205	26	53	4	2.70	5.94	1.00	6.94
32	do.....	704	1,639	2.33	Sept. 11 to Sept. 19....	8	936	2,064	425	26	60	4	2.20	4.79	1.78	5.57
33	do.....	576	1,322	2.29	Sept. 12 to Sept. 19....	7	1,057	2,541	218	16	38	1	3.51	7.43	1.16	8.59
34	do.....	896	2,160	2.41	Sept. 13 to Sept. 19....	8	766	1,540	381	18	43	7	2.77	5.76	.87	6.63
35	do.....	576	1,326	2.30	Sept. 14 to Sept. 20....	7	691	1,600	274	21	48	2	2.52	5.17	.78	5.95
36	do.....	512	1,352	2.64	Sept. 17 to Sept. 22....	6	532	1,551	199	15	39	46	2.67	5.22	.77	5.99
37	do.....	2,010	5,028	2.50	Sept. 18 to Sept. 24....	7	2,492	5,934	906	18	45	46	2.75	5.56	.78	6.34
38	do.....	3,410	8,577	2.52	Sept. 20 to Sept. 27....	8	5,115	9,907	1,330	16	39	30	3.85	8.85	1.00	8.85
39	do.....	2,910	7,167	2.46	Sept. 21 to Sept. 30....	10	5,733	8,737	1,570	22	54	34	3.65	7.41	.85	8.26
40	do.....	2,580	6,516	2.52	Sept. 21 to Oct. 1....	11	5,728	8,046	1,550	24	59	39	3.74	7.45	.86	8.31

EXPERIMENT D, STATION 2, 1912—Continued.

Details of seeding experiments in 1911 and 1912—Continued

Lot.	Class.	Number in.	Total weight in.	Average weight in.	Dates fed.	Days fed.	Total feed.	Total weight out.	Total gain.	Per cent gain.	Gain per 100 head.	Dead.	Cost of labor per pound of gain.	Total cost per pound of gain.
41	Springers	7,100	2,55	1912.	Sept. 23 to Oct. 2.....	10	5,732	1,490	3,560	7.90	0.90	8.80	8.80	
42	"	2,740	3,100	2,50	Sept. 24 to Oct. 3.....	10	5,616	3,811	3,997	7.90	.84	8.11	8.11	
43	"	960	2,439	2,54	Sept. 25 to Oct. 4.....	10	5,997	2,928	4,069	7.90	.94	9.05	9.05	
44	"	1,470	3,813	2,60	Sept. 26 to Oct. 6.....	11	3,293	5,483	4,190	7.90	.57	1.13	10.70	
45	"	576	1,434	2,49	Sept. 27 to Oct. 6.....	10	1,558	1,775	341	4.77	5	.81	7.63	
46	do	4,180	10,571	2,53	Sept. 29 to Oct. 8.....	10	8,444	12,741	2,170	21	.52	3.89	7.78	
47	"	1,960	5,247	2,64	Sept. 29 to Oct. 9.....	11	4,338	6,065	818	16	.41	5.43	10.83	
48	"	660	1,772	2,68	Oct. 1 to Oct. 9.....	9	1,715	2,092	320	18	.48	3.67	7.34	
49	"	5,036	2,74	3,110	Oct. 3 to Oct. 11.....	9	3,110	5,033	507	11	.31	5.49	11.23	
50	"	1,540	4,149	2,69	Oct. 5 to Oct. 15.....	11	3,265	4,754	605	15	.39	5.40	10.89	
51	"	800	2,315	2,89	do.....	11	1,696	2,692	377	16	.47	4.50	9.07	
52	"	1,500	2,232	2,82	Oct. 6 to Oct. 16.....	11	3,210	4,870	638	15	.43	5.03	10.11	
53	"	2,390	6,796	2,84	Oct. 9 to Oct. 21.....	13	6,118	7,946	1,150	17	.48	5.32	10.21	
54	"	1,080	2,789	2,58	Oct. 11 to Oct. 22.....	12	2,506	3,331	542	19	.50	4.62	8.79	
55	"	1,180	3,181	2,70	Oct. 10 to Oct. 23.....	14	3,245	5,379	398	13	.34	8.16	15.60	
56	"	960	2,606	2,71	Oct. 11 to Oct. 23.....	13	2,419	3,036	430	17	.45	5.63	10.72	
57	"	1,920	5,198	2,71	Oct. 11 to Oct. 24.....	14	5,203	6,134	936	18	.49	5.56	10.48	
58	"	400	1,163	2,66	Oct. 11 to Oct. 25.....	15	1,164	1,312	179	15	.45	13.50	12.16	
59	"	940	6,860	2,86	do.....	15	3,175	4,899	18	.52	23	5.59	10.46	
60	"	480	1,321	2,75	Oct. 13 to Oct. 27.....	15	1,397	1,472	151	11	.31	9.25	17.13	
61	"	960	2,869	2,99	do.....	15	2,794	3,109	240	8	.25	4.45	21.56	
62	"	1,600	4,833	3,02	Oct. 17 to Oct. 29.....	13	3,984	5,292	439	10	.29	4.45	21.92	
63	"	1,040	3,205	3,08	Oct. 19 to Oct. 30.....	12	3,423	3,484	279	9	.27	2.25	15.38	
64	"	1,680	5,077	3,02	Oct. 20 to Oct. 31.....	12	3,965	5,725	648	13	.39	12.33	11.09	
65	"	1,300	4,203	3,23	Oct. 22 to Nov. 1.....	11	2,860	4,435	232	6	.18	4.44	12.33	
66	"	768	5,334	3,30	do.....	11	1,690	2,895	361	14	.47	8	1.32	
67	"	924	3,004	3,25	Oct. 25 to Nov. 3.....	10	1,894	3,284	280	9	30	.....	14.88
68	"	2,280	7,701	3,02	Oct. 29 to Nov. 4.....	9	4,264	8,427	726	9	32	5.87	13.13	
69	"	1,060	3,446	3,25	Oct. 30 to Nov. 5.....	7	8,643	8,843	397	12	38	4.14	9.38	
70	"	512	1,373	2,68	Oct. 30 to Nov. 6.....	8	1,906	1,506	133	10	26	6.81	13.36	

71	do.....	572	Oct. 31 to Nov. 6....	7	881	2,036	192	10	34	3	4.59	9.15
72	do.....	1,844	Nov. 2 to Nov. 7....	6	1,882	5,324	462	10	31	10	4.07	1.64
73	do.....	4,862	Nov. 5 to Nov. 10....	6	2,158	5,899	299	5	18	13	8.31	1.62
74	do.....	5,600	Nov. 6 to Nov. 11....	6	1,882	5,088	326	7	22	7	7.22	3.05
75	do.....	1,470	Nov. 7 to Nov. 12....	6	975	2,694	136	5	18	5	7.17	2.52
76	do.....	768	Nov. 9 to Nov. 14....	6	2,305	6,353	375	6	22	11	6.15	11.66
77	do.....	1,720	Nov. 8 to Nov. 13....	6	2,352	7,203	570	9	29	15	4.83	2.61
78	do.....	5,978	Nov. 10 to Nov. 17....	6	3,819	7,699	489	7	23	24	14.60	14.21
79	do.....	6,633	Nov. 9 to Nov. 14....	6	2,752	7,203	570	9	29	15	4.83	1.98
80	do.....	2,170	Nov. 12 to Nov. 18....	7	799	1,923	165	9	32	3	3.28	11.32
81	do.....	512	Nov. 17 to Nov. 22....	7	1,561	3,799	198	6	19	12	8.59	10.61
82	do.....	1,020	Nov. 13 to Nov. 19....	7	1,561	3,799	198	6	19	12	7.88	10.61
83	do.....	832	Nov. 14 to Nov. 19....	6	1,048	3,078	205	7	25	4	5.11	8.57
84	do.....	1,470	Nov. 15 to Nov. 20....	6	1,808	5,486	358	7	24	8	5.05	1.95
85	do.....	1,470	Nov. 16 to Nov. 21....	6	1,749	5,435	391	8	27	11	4.47	1.72
86	do.....	1,280	Nov. 17 to Nov. 22....	6	1,549	4,498	287	7	22	7	5.40	1.39
87	do.....	4,211	Nov. 18 to Nov. 23....	7	1,595	3,523	242	7	27	3	6.59	8.84
88	do.....	3,29	Nov. 19 to Nov. 24....	9	1,595	3,523	242	7	20	2	8.13	12.29
89	do.....	896	Nov. 20 to Nov. 25....	8	1,049	2,394	129	6	23	11	6.14	15.00
90	do.....	660	Nov. 21 to Nov. 26....	7	1,816	4,866	296	7	25	5	5.96	9.44
91	do.....	1,270	Nov. 22 to Nov. 28....	7	1,616	3,861	271	8	5	5	8.89	1.38
92	do.....	3,590	Nov. 23 to Nov. 28....	7	1,616	3,861	271	8	5	5	8.89	1.38

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